Physical activity for people using mental health services

A framework for action in Wales

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RC PSYCH ROYAL COLLEGE OF PSYCHIATRISTS

CB SEIC COLEG BRENHINOLY SEICIATRYDDION

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in collaboration with

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Public Mental Health Implementation Centre

About this report

This report was commissioned by the Welsh Government as part of the Dyfodol Programme.

The NHS Wales Joint Commissioning Committee (JCC) & Royal College of Psychiatrists Wales Dyfodol Programme supports the enhancement of mental health services and delivery of optimal care for those people in Wales with serious and enduring mental illness.

The Dyfodol Programme enables the Welsh Government and national partners to acquire valuable insights to plan and commission effectively.

This framework report identifies priority areas for action to support the design and implementation of physical activity interventions for people with mental health conditions in Wales.

About the PMHIC

The Public Mental Health Implementation Centre (PMHIC) was launched by the Royal College of Psychiatrists (RCPsych) in 2022. The aim of the PMHIC is to support the improved implementation of evidence-based interventions to treat mental disorders, prevent associated impacts, prevent mental disorders, and promote mental wellbeing and resilience.

The PMHIC is supporting the Dyfodol Programme, a partnership between RCPsych Wales and NHS Wales' Joint Commissioning Committee (JCC), and collaborating to produce a series of reports on the shared causes of physical and mental ill health.

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List of abbreviations

JBI	Joanna Briggs Institute
MMAT	Mixed Methods Appraisal
PA	physical activity
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
RCPSYCH	Royal College of Psychiatrists
RCT	randomised controlled trial
SMI	severe mental illness
WHO	World Health Organization

Definitions

Body mass index (BMI): Measure of body weight relative to height. Normal BMI ranges between 18.5–25.0, with below and above ranges predicting higher morbidity and mortality. BMI is calculated by dividing a person's weight in kilograms by the square of their height in metres (1).

Commercial determinants of health: The influence of private sector activities on public health and the consequent impact on political and economic systems, and norms (2).

Mental health condition: A wide range of conditions that affect an individual's emotional, psychological and social wellbeing, but do not necessarily meet the criteria for SMI (3). These conditions include common mental disorders such as anxiety and depression, which do not involve the level of impact on daily life often associated with those living with a diagnosis of SMI(4).

Obesogenic environment: One that promotes weight gain and is not supportive to weight loss (5).

Obesity: The World Health Organisation defines obesity as a BMI greater than or equal to 30 kg/m^2 (5).

Physical activity: Any bodily movement produced by skeletal muscles that involves energy expenditure (for example, exercise such as cycling or movement as part of leisure time) (6).

Quality statements: The commitments that providers, commissioners and system leaders should live up to. Expressed as 'we statements', they show what is needed to deliver high-quality, person-centred care.

Sedentary: Any waking behaviour, such as sitting, reclining or lying down, that involves low energy expenditure of 1.5 metabolic equivalents or less (7).

Severe mental illness (SMI): Mental disorder that interferes with a person's life activities and ability to function and is associated with diagnoses of psychosis, schizophrenia and bipolar affective disorder (4).

Social determinants of mental health: Structural conditions that influence individual mental health outcomes across the lifespan and contribute to mental health disparities (8). Household income that predicts education, our built environment (that is, adequate housing, access to green and blue spaces), ethnicity, employment and social connections are all examples of social determinants.

Executive Summary

There is evidence that demonstrates the positive impact of physical activity on mental health outcomes. Several studies have shown that regular physical activity can reduce symptom severity, making it beneficial for both common and severe mental illness (SMI), as well as for general mental wellbeing. The National Institute for Health and Care Excellence (NICE) recommends group-based exercise as a sustainable and effective intervention for people experiencing mild-to-moderate depression (NICE CG91, 2009). Complementary public health initiatives, such as the NHS England Better Health: Every Mind Matters campaign, reinforce the value of even brief sessions of physical activity, such as a 10-minute brisk walk, in enhancing mood and emotional resilience. Our report examines best evidence, and highlights obstacles to implementation that can mostly be overcome using modest resources to maximum benefit.

Physical activity outcomes across settings

In Wales, findings from some studies indicate that physical activity interventions show positive mental health outcomes across settings:

- Community-based programmes provide the benefits of strong social support networks and sustained engagement.
  - However, their scalability is constrained by limited funding and a shortage of qualified professionals.
- When appropriately delivered, physical activity programmes in secure units and prisons can have a positive impact on mental health.
  - However, participation can be hindered by low self-esteem and poor baseline physical health.
- Exercise referral schemes have also demonstrated improvements in the mental wellbeing of participants who adhere to the programme.
  - However, low motivation and low self-efficacy can contribute to reduced engagement and limit long-term sustainability.

Despite the benefits of physical activity, integrating it into routine mental health care presents challenges. These include insufficient training and awareness about physical activity among healthcare professionals, as well as resource constraints and a lack of access to skilled physical activity professionals. Conversely, successful implementation is often supported by well-trained staff and tailored interventions, particularly in secure settings.

Quality statements and framework for action

Drawing on the evidence, this report proposes a set of quality statements and a strategic framework for action in Wales, with potential applicability across broader contexts. Key recommendations include:

- promoting community-led approaches for common conditions
- ensuring the involvement of qualified physical activity professionals
- securing adequate resourcing.

The quality statements call on system leaders to address gaps and promote a person-centred, evidence-informed approach to embedding physical activity within mental health care.

Lay Summary

Being active can help your mental health

Research shows that moving your body can make you feel better if you have common mental health problems like depression or anxiety. It can also help people with more serious conditions, such as psychosis. Studies suggest that exercise can reduce symptoms of psychosis.

Physical activity means any movement that uses energy, like walking, cycling or playing sports. It doesn't have to be hard exercise – even short bursts of movement can help. For example, the NHS England campaign Every Mind Matters says that a 10-minute walk can improve your mood. In the UK, health experts recommend group exercise as a good long-term option for people with mild or moderate depression(9).

Why this report was written

The Royal College of Psychiatrists in Wales asked the Public Mental Health Implementation Centre to write this report for the Welsh Government. The aim was to look at how physical activity can support mental health in different places across Wales. The report includes:

- a general overview
- real-life examples
- a review of evidence from Wales
- what helps or makes it harder for programmes to succeed.

What we found

Reports from Wales show that physical activity can improve mental health in many settings. Community programmes help people stay active and give them social support. But there are challenges, like not enough funding and too few trained staff.
Exercise can also help people in secure units and prisons, but low confidence and poor physical health can make it harder for them to join in. Exercise referral schemes – where people are referred to activity programmes – can improve wellbeing, but motivation and confidence often drop over time.

Challenges and what works

It's hard to make these programmes a regular part of mental health care. Problems include:

- lack of knowledge and resources among healthcare staff
- limited funding
- not enough trained professionals.

However, having skilled staff and programmes designed for each setting can make a big difference.

What needs to happen

The report gives guidelines and a framework for action. These apply to Wales but can be used elsewhere too. Successful programmes should:

- involve the community
- include trained physical activity professionals
- be properly funded

Quality standards encourage leaders to focus on each person's needs and close gaps in support.

Quality Statements

The following quality statements are based on the evidence gathered throughoutthe development of this report. They are to guide leaders and decision-makers, and outline commitments to support person-centred mental health care across Wales. They establish the key standards for designing and implementing physical activity programmes for people using mental health services in Wales, reflectingspecific priorities and locally relevant interventions. The statements should be widely transferable to other regions and contexts.

Quality statement 1: Collaborative design with physical activity professionals

We will work in partnership with qualified local physical activity professionals to co-develop guidance, implementation plans and delivery models that support safe, effective and person-centred interventions.

Quality statement 2: Inclusive programme design to meet diverse needs

We will design and deliver physical activity programmes that are responsive to the varied needs of individuals, recognising that not all people can access community-led sessions due to health, mobility, stigma or other barriers. We will involve local communities and people with lived experience in advisory roles to promote equity and relevance. This can include physical activity for people who are, for example, housebound or live in isolated communities.

Quality statement 3: Equitable, person-centred care in secure settings

We will ensure that people in prisons and secure units can receive tailored physical activity support that reflects their mental health needs, promotes recovery and supports equitable access and outcomes.

Quality statement 4: Sustainable investment in community-based programmes

We will commit to securing and allocating appropriate funding to support the development and delivery of community-based physical activity programmes (such as group-led activities), to engage people in sustainable physical activity programmes. We will recognise the disparities in provision across local authorities and the impact of limited access on population health.

Contents

1.
Introduction

The RCPsych in Wales has a formal partnership with the NHS Wales' Joint Commissioning Committee (formerly known as the National Collaborative Commissioning Unit), called the Dyfodol (in English, 'Future') programme. The Dyfodol Programme joins clinical expertise to mental health commissioning and reports to the Ministerial Oversight Board for Mental Health. The work of this partnership comprises regular reports and reviews.

This report is part of a series, on physical activity (PA) and mental health. It was developed by the PMHIC, established by the RCPsych and hosted by the National Collaborating Centre for Mental Health.

The PMHIC report series can be accessed under 'Physical health' on the Dyfodol programme web page.

1.1 Report objective and rationale

Numerous studies highlight the importance of PA in supporting mental health across a variety of settings. The primary aim of this report is to examine the implementation and mental health outcomes of PA-based interventions in contexts relevant to Wales.

This report seeks to identify gaps in the literature and explores implications for practice in Wales, with insights that are anticipated to be relevant and transferable to broader mental health conditions, serving as a solution to common settings.

In addition, this report supports RCPsych's earlier publications which highlights the importance of PA in promoting good mental health and tackling mental illness.

2.
Method

This report involved a rapid scoping review which included structured mapping and narrative analysis of the wider evidence base (Section 3.1 and Section 3.2), case studies for contextualisation (Section 3.3) and synthesis of findings relevant to Welsh contexts (Section 3.4). These findings underpinned the development of the quality statements and framework for action.

We took this approach because of the broad and heterogeneous nature of the evidence in this field. PA encompasses a wide range of interventions, while mental health also includes a range of conditions and general wellbeing.

For the narrative review of the wider evidence, literature was sourced and selected from search engines, using the key terms identified for the systematic search outlined below.

2.1 Systematic search for Wales-specific evidence

The search for the corresponding section of the report was conducted systematically, following Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines (10). Appendix 1 presents a PRISMA diagram showing the number of studies identified via databases, registers and other methods for this report.

The review included studies and grey literature on PA interventions for the Welsh population, focusing on conceptual and contextual insights For the search strategy, we used key terms (such as 'mental illness', 'exercise', 'Wales', 'hospitalisation', 'inpatient' and so on) and their synonyms. These were entered into the following databases: MEDLINE, PubMed, Embase, Cochrane, PsycINFO, Scopus and Web of Science.[1]

Key terms were also searched in the grey literature from the websites gov.uk, open science, BASE (Bielefeld Academic Search Engine), Mind UK and NHS Wales. Inclusion of grey literature provided insights into real-world interventions and practical challenges that may not be detailed in peer-reviewed journals. See Appendix 2 for the formulation and search terms used.

[1] MEDLINE and PubMed = National Library of Medicine's bibliographic databases; Embase = Excerpta Medica database; Cochrane Library database; PsycINFO = American Psychological Association database; Scopus and Web of Science = Elsevier databases.

2.1.1 Study selection

Following the initial search, all identified citations were imported into Rayyan software (2016) for screening (11). Duplicate records were removed. Articles published before 2007 were excluded to ensure consistency with legislative developments, reflecting the amendments made to the Mental Health Act (1983) in 2007, which redefined several mental health conditions (12,13).

Articles (including randomised controlled trials and observational studies) were eligible for inclusion if they reported on PA interventions delivered to individuals experiencing mental health conditions within Wales and were published in English or Welsh languages. Studies that did not feature PA as a core intervention or as part of a broader intervention module were excluded. Remaining articles were assessed, and those meeting eligibility criteria were included in the final synthesis. Further details on the selection process and included articles are provided in the PRISMA diagram in Appendix 1. Data was charted by extracting key information from each resource. This data included the design, methodology, population, type of intervention and main outcomes. Barriers and facilitators of implementation were identified, and settings for the selected articles were grouped.

Following data extraction, studies were assessed for methodological quality. While quality assessments are usually not mandatory for reports of this nature, it is becoming increasingly common when the goal is to inform policy or practice. The information was used to offer insight into the methodological strengths and limitations of included studies. Quality assessments were used descriptively and did not influence inclusion of sources.

3.
Findings

3.1 Narrative review: Mapping the mental health landscape

Overview

In this section, we present a narrative analysis of the broad contextual landscape and internationally relevant evidence. This section follows the areas of mental health often associated with PA, which include:

- PA and mental health conditions (Section 3.1.1)
- PA, mental health and sleep (Section 3.1.2)
- premature mortality (Section 3.1.3)
- supporting recovery (Section 3.1.4)
- PA and health inequalities (Section 3.1.5)
- social determinants of mental health (Section 3.1.6)
- the obesogenic environment (Section 3.1.7)
- the commercial determinants of obesity and poor mental health (Section 3.1.8).

3.1.1 Physical activity and mental health conditions

Evidence for the benefits of PA for clinical populations shows significantly positive effects (14). PA can play an important role in the lives of people living with mental illness, and has been noted to have biological, psychological and social benefits. People living with SMI often face physical health problems, especially cardiac and metabolic diseases, which contribute to a reduced life expectancy of around 7–25 years compared with the general population (15,16). PA can help reduce this risk and improve health outcomes (17). PA can also ease symptoms such as poor memory and cognitive difficulties (18).

People living with mental illness can struggle with social isolation and daily functioning, and PA can help build social interactions and integration, enhancing social connections and life skills (17,19). For community-based programmes to lead to improved mental wellbeing, the social connection and peer support aspects are vital(20). Social support from peers and networks can lead to continued engagement in activity, because positive social influence ensures commitment (21). To ensure long-term maintenance, social networks are considered a key mechanism (22).

While some reports show a significant increase in the number of sedentary people becoming moderately active, their satisfaction is often associated with the involvement of PA professionals(23). PA professionals play an important role in overcoming barriers in terms of anxiety related to the exercise environment (22).

PA in secure settings can be beneficial to individuals beyond treatment practices (24), as it offers people the opportunity of increased autonomy (25). Lack of knowledge of the benefits of PA and professional support, coupled with psychological barriers (such as stress), hinder people from fully engaging in PA (26).

In mental health secure units, symptoms of illness often impact motivation; for example, for people experiencing psychosis, negative symptoms (such as deficiency in motivation and self-care) in addition to positive symptoms (such as auditory hallucinations) may prevent participation in activities (25). However, if staff do not have the skills or understanding of PA, they may not be providing people with appropriate or correct information (25). Trust during interventions is enhanced when delivered by trained professionals, for example instructions from a PA professional (27). Staff training that does not include content on PA and, consequently, a limited understanding of patients' existing symptoms may act as barriers to engagement, alongside patient-reported low self-motivation and self-efficacy (28,29).

People living with SMI may face additional challenges in meeting PA guidelines compared with the general population. Research shows that this group often have higher rates of unemployment, fewer years of formal education, elevated BMI, longer illness duration, use of antidepressant and antipsychotic medications, and reduced cardiorespiratory health (30). PA interventions are also recommended for population mental health, considering the beneficial impact on mood, self-esteem and social networks (27). The benefits of PA-based interventions are shown to also have beneficial effects on sleep quality and quality of life (32,33).

Staff are key to encouraging inpatients to engage in physical activity

More broadly, evidence shows that PA interventions for inpatients have included tailored and structured programmes working with PA professionals (29). The details of some of these interventions are limited; however, following the intervention, people reported improvements to their wellbeing and mental state. In most studies, staff in mental health units are often considered key figures in encouraging PA and ensuring engagement especially when patients report a lack of motivation (25,34,35). Congruently, stakeholder perceptions of exercise referral schemes in Wales have revealed that the PA beliefs of the referrer, and patient motivation levels, were key referral barriers (36). For those with complex health or mental health conditions, motivation levels are often low (37).

3.1.2 Physical activity, mental health and sleep

There is a well-established positive relationship between PA and sleep, in both duration and quality (38). A systematic review on the interrelationship between sleep and exercise synthesised 29 studies: most of those studies (n=22) noted that exercise improves sleep. These benefits increase with participants' age, that is, older participants' sleep quality benefitted more from exercise (38). However, four studies reported no benefits of exercise, and one reported that participants slept less well (38).

The timing of when exercise is undertaken was also important: a large study of 909 University students (38% female) showed that people who exercised in the evening went to bed later and slept less than participants who exercised earlier in the day (39). A meta-analysis of 22 randomised controlled trials (RCTs)showed that regular exercise(of varying intensity) improved insomnia (40). Short-term exercising was rated as more helpful, meaning that people who report poor sleep might be signposted to taking up gentle exercise as part of a treatment package. The authors also looked for differences between varied and gentle mind-body exercise and found both had the same effect size in improving sleep quality (40).

The benefits of PA improving sleep, and thereby other important quality of life outcomes, have also been proven in people living with schizophrenia and people living with common mental health conditions (41,42). Teasdale and colleagues (2025) offered an Internet-based cognitive training programme (4 hours total) plus exercise sessions to 48 people who had a new diagnosis of schizophrenia in the past 2 years. Participants completed an average of 12 hours of group-based and individual home-based exercise sessions, improvements in sleep duration and quality were reported (41). A recent meta-analysis (973 people with schizophrenia across 17 independent studies) showed benefits of aerobic exercises in reducing positive and negative symptoms (43).

Risk and protective factors

The relationship between sleep and poorer mental health, for example depression, is bidirectional (44). Daytime naps were one of four strong risk factors for people to progress to depression – the others were increased time spent on computers, mobile phones, and television (45).

By contrast, six protective factors have been identified (46–48):

- confiding in others
- total sleep duration
- exercise such as cycling or swimming
- walking pace
- joining a gym or club
- higher cereal intake.

3.1.3 Premature mortality

Premature mortality is strongly linked to both poor mental health and low PA, with these factors often interacting to create a significantly elevated risk of early death. Unhealthy lifestyle behaviours are linked to premature mortality, the risk of which is heightened when coupled with SMI (49). Research consistently shows that people living with SMI have a reduced life expectancy of 7–25 years compared with the general population. This disparity is primarily driven by a higher prevalence of physical health conditions such as cardiovascular disease, diabetes and respiratory illnesses (34). Contributing factors include lifestyle behaviours such as smoking, poor diet and, critically, low levels of PA (34). Low PA combined with short sleep duration is also then linked to increased risk of mortality (32).

Physical activity increases lifespan while improving mental health

Being active, on the other hand, is shown to be a protective factor against premature mortality. Studies show that consistent PA can lower the risk of early death from any cause (50). The benefits are so substantial that even people who become active later in life can significantly reduce their mortality risk (51).

The protective effect of PA extends beyond physical health, as it is also a powerful intervention for improving mental health. It can reduce symptoms of depression and anxiety, improve self-esteem, and enhance overall wellbeing(51). This suggests a vital, bidirectional relationship whereby poor mental health can lead to a sedentary lifestyle, which increases the risk of chronic physical diseases and premature death, while engaging in PA can improve mental health, thereby reducing the likelihood of these detrimental health behaviours and outcomes.

3.1.4 Supporting recovery

PA is often associated with better health and mental health outcomes (52). PA, even at low-to-moderate intensity, can significantly reduce the symptoms of depression (44). Regular exercise promotes the release of key neurotransmitters such as serotonin, dopamine and norepinephrine, which are critical for mood regulation and motivation. It also stimulates the production of brain-derived neurotrophic factor, a protein that supports the growth and survival of brain cells, helping to counter the neural atrophy often observed in major depressive disorder (44).

In addition, PA is linked to self-efficacy, as motivation to improve PA and adopt healthy lifestyles is then shown to counteract low self-efficacy (53). Beyond its direct impact on symptoms, PA supports broader recovery by addressing social and physical comorbidities. For people living with SMI, PA plays a critical role in mitigating the risk of premature mortality, which is often driven by high rates of cardiovascular disease and metabolic syndrome (17).

Exercise is shown to improve physical health, but it also enhances cognitive function – and further provides a solution to social isolation through social connections gained through group activities. Both Sport Wales (2022) and Public Health Wales (2022) report the benefits of physical education and PA for better mental health outcomes; these include improved mood and social connectedness (54,55). Findings from the ongoing Co-SPACES (community-based PA providers supporting people living with SMI) project will further inform discussions around the sustainability of PA for those living with SMI (56).

3.1.5 Physical activity and health inequalities

Health is influenced not only by individual lifestyle and biology but also by socioeconomic, cultural and environmental determinants (57). Cultural and environmental differences in health are conceptualised as health inequalities, and these determine the health conditions people may experience (58).

Disparities in PA are a major driver of health inequalities, as access to and engagement in PA are not distributed equally across populations. Emerging studies indicate that people with lower incomes, people from minoritised ethnic groups, and older people are less likely to be physically active (59). Health inequalities and related barriers to PA are magnified for people experiencing SMI, who engage in substantially lower levels of PA (60), and this has been observed in both community and inpatient settings (61,62).

Barriers to equity

Barriers to equity in access to PA include fear of stigma, costs of travelling to and taking part in the PA, lack of transport to the PA (especially in rural locations where there may be a lack of public transport) and difficulties accessing PA, such as booking PA sessions (63).
Transport systems have been noted as a barrier to mobility (64). Limited access to transport, and poorly designed pedestrian environments (such as lack of pavements and crossings) further hinder movement (65). This disadvantage is magnified, for example, for older people and marginalised communities who are disproportionately affected by inequities. This disadvantage is also pronounced for residents living in rural and semi-rural areas, where geographical access to services and the available infrastructure lead to car reliance (67).

Recent digital advances have exacerbated barriers. It is important to consider these inequalities in the context of rapid digital advances in mental health, where there are increasing opportunities for digitally delivered PA. These advances mean many PA opportunities need to be booked online, in advance. People living with SMI face more barriers to accessing digital health interventions than those without SMI, often due to a lack of resources – that is, not having basic digital skills or no access to digital goods (68). For instance, one study found that 42% of people living with SMI did not have basic digital skills (68).

3.1.6 Social determinants of mental health

Social determinants impact people's health every day, and studies of social determinants focus on socioeconomic status, race, ethnicity and the environment in which people live, work and age (68). Social determinants such as poverty can be the cause and consequence' of mental ill health; people living in poverty often face high levels of stress, which is linked with several mental health conditions such as depression and anxiety (69). This extends to PA outcomes.

Engagement in PA is shaped by social determinants such as income, equipment costs and education level (70). A systematic review by Nour and Altintaş (2023) identified lack of PA to be a significant risk factor for obesity in children and adolescents, particularly those belonging to socially vulnerable population groups who had less opportunity for outdoor activities (71).

Modifying social determinants to promote health equity

Social determinants are modifiable, and significant factor for mental health interventions and for the promotion of positive mental health (8). The World Health Organization (WHO) recently published a report on how to mitigate upstream social determinants that generate large inequalities in health and drive poor mental and physical health for people living with SMI. The report recommended investing in social infrastructure (64). To promote health equity, it highlights:

- universal public services
- overcoming structural discrimination
- establishing governance arrangements
- managing challenges (such as climate change)
- utilising opportunities (such as digital transformation).

Social determinants should be emphasised when shaping policies aimed at supporting people most in need of interventions such as PA.

3.1.7 The obesogenic environment

Secure hospitals are considered obesogenic, given that the environment promotes unhealthy eating habits, a lack of PA and, ultimately, excessive weight gain (72,73). Inpatient settings also include young people who are already overweight and may be prone to weight gain over time (74). Factors within secure hospitals that contribute to them being obesogenic environments include the influence of the physical and built environment, the restrictive nature of secure care and the accessibility of high-calorie foods (73).

The restrictive nature of secure care is a key contributor to sedentary behaviour (70,71), given that those treated in secure hospitals have limited access to spaces outside of the hospital.

For example, many people receiving care in secure hospitals are not permitted to leave the hospital without permission from their responsible clinician, or, if they are detained under a restricted section of the Mental Health Act, from the Ministry of Justice (75). For many people treated in secure hospitals, their mental health challenges or perceived risk is such that they are not granted leave. This is of particular concern given that outdoor-based interventions are shown to improve mental health outcomes across all populations, including people with long-term conditions, common mental health problems, severe mental health conditions and healthy adults (76). Outdoor spaces, such as parks and beaches, are important for promoting mental health (75,77).

The direct links between positive mental health and outdoor spaces are well established; however, location data can further determine the availability and use of outdoor spaces and its impact on mental health. Such datasets are being used from Welsh settings to explore individual engagement with outdoor spaces for activities in comparison with visits to alcohol outlets over time, to develop preventive measures and reduce the risk of mental health conditions (77).

For people treated in secure hospitals, a lack of PA is compounded by limited opportunities to be active within the secure setting, and contributes, in part, to high levels of sedentary behaviour in the population (78). Some services have physical health facilities such as on-site gyms; however, gym attendance is reliant on staff availability which can be problematic as many secure services are understaffed (30,79,80).

The obesogenic nature of secure care is particularly prevalent for newly admitted individuals, as they will have heightened restrictions of leave and, in some cases, access to on-site facilities. This lack of access to PA may be a contributing factor to the elevated risk of weight gain seen in newly admitted individuals (81). Nonetheless, it is important to note that for many people treated in secure care, it is not necessarily a lack of opportunity to engage in PA that is precipitating sedentary behaviour; rather, it may be that motivation to engage in PA is low, combined with obesogenic medication (73,82–84), and low motivation is exacerbated by poor mental health (26).

Integrating mental and physical health care

The obesogenic nature of inpatient environments may also be influenced by a lack of integrated health care. A King's Fund report on integrated care initiatives identified a gap in cohesive mental and physical health care provision within psychiatric services (85). The authors propose that the culture within inpatient services is such that physical health care is placed low on the list of treatment priorities, and the focus is on the treatment of mental health. This is despite the negative impact that poor physical health can have on mental health outcomes (34). Other explanations for this lack of integrated health care include mental health professionals feeling they lack the skills or confidence to identify physical health issues (73,86), or that they feel it is not within their remit to facilitate physical health care as mental health professionals (30,87–90).

Empowering people using services and staff

A study by Haddad and colleagues (2016) highlights that deficits in knowledge and attitudes of mental health staff towards physical health care can be addressed through staff training (91). Similarly, findings from a review by Rodgers and colleagues (2016) suggest that empowering staff and service users, and removing barriers to delivering and accessing integrated care, can lead to improved physical health outcomes for people treated in inpatient settings (92).

3.1.8 Commercial determinants of obesity and poor mental health

Commercial determinants of health shape public health outcomes both directly and indirectly. Evidence of smoking being associated with higher levels of depression and anxiety illustrates direct influence (93). An example of indirect effects is advertisements placing responsibility for the harmful effects of products such as alcohol on consumers (94).

Applied to mental health, commercial determinants encompass the influence of produced commodities (such as alcohol) and their marketing on mental health outcomes (95). Commercial entities often prioritise profit over public health, and shape consumer behaviour by encouraging the consumption of their marketed products(95,96). Six industries are identified as particularly influential in this regard:

- alcohol
- fossil fuels (including climate change, air pollution and wider pollution impacts)
- gambling
- social media
- tobacco
- ultra-processed foods.

People experiencing SMI are often disproportionately affected; health inequalities exacerbate mental and physical health conditions, including obesity (97). Evidence shows a bidirectional relationship between obesity and mental illness for people living with SMI who are more likely to experience obesity (97). This challenge is even more pronounced within secure health settings, in which around 80% of people are estimated to be living with obesity (73). Commercial determinants are central to this challenge.

Obesity has multiple interacting determinants (including biological, behavioural, environmental and socioeconomic), which together form an obesogenic environment (98); see also Section 3.1.7).

Commercial determinants also shape perceptions of PA. The commercial imperative to advertise PA-related consumer products (expensive gym subscriptions and exercise gear, fad diets, personal trainers) make participation seem inaccessible for many (95). For people living with SMI, these commercial influences compound challenges such as stress, tiredness and low mood that already act as barriers to engaging in PA (26). Given these relationships, evidence indicates that the influence of commercial determinants must be considered in mental health frameworks (95).

3.2 Systematic review of Wales-specific evidence

Overview

PA provision in Wales (Section 3.2.1) is illustrated using case studies (Section 3.2.2) and the results of a systematic approach to searching the Wales-specific evidence base (Section 3.2.3 to Section 3.2.7). The overall search yielded 106 articles. The key themes are:

- PA to improve mental health (Section 3.2.4)
- PA schemes (Section 3.2.5)
- PA in secure settings (Section 3.2.6)
- evidence on barriers and facilitators to engaging in PA (Section 3.2.7).

This section also includes a quality appraisal (Section 3.2.8) of the studies included in the review.

3.2.1 Current provision in Wales

The Together for Mental Health strategy 2012–22 (Welsh Government, 2012) emphasised that sport and PA should be utilised as a preventive strategy to support mental health (101). The strategy document advocates embedding exercise activities within the community, by acknowledging the role of sports and culture in improving individual and collective emotional wellbeing. Some policies have explicitly included PA guidelines with some supporting mental health; however, the implementation of these policies required further evaluation (102). Public Health Wales and partners including Sport Wales were working to increase PA in schools. Public Health Wales' framework, Whole School Approach to Emotional and Mental Well-being, aimed to embed support for mental health within the school environment, with a strong focus on PA as a key component (103).

The Together for Mental Health Strategy (referred to above) has been superseded by the new 10-year Mental Health and Wellbeing Strategy 2025–2035 (104). The new strategy continues to acknowledge the role of sport and PA as protective factors in supporting mental health and wellbeing with reports of positive outcomes. The initial 3-year Delivery Plan 2025 to 2028 accompanying the strategy includes a commitment by the end of Year Three (2028) to 'ensure that people have access to high-quality psychosocial intervention and meaningful activity in inpatient settings(105). It also includes commitments around ensuring that people living with long-term mental health conditions are supported in having their physical health needs met, by expanding access to evidence-based physical healthcare and support for behaviour change.

Interventions and initiatives

Examples of well-evidenced interventions include community walking groups aimed at older adults at risk of isolation and live well courses from NHS Wales that include PA modules (106). Provision of PA varies, ranging from policy-level strategies to local, targeted interventions. Nonetheless, a growing body of evidence is emerging, which shows community-led interventions are preferred as they have a significantly positive impact (106,107). Sport Wales and the Culture, Communications, Welsh Language, Sport, and International Relations Committee (2022) strongly advocated for supporting people with mental health problems through strategies which encourage increased PA, particularly in disadvantaged areas (108). Moreover, as part of the Welsh Government's Healthy Weight: Healthy Wales strategy, those over the age of 60 are offered free fitness classes at leisure centres, outdoor spaces and community venues to support their weight and mental health (109).

In addition, community-based initiatives by the Cardiff City FC Foundation (an official charity of the Cardiff City Football Club), address mental health issues faced by children and young people by encouraging children and families to engage in PA (110). This initiative aimed to deliver the longer-term goals of the foundation and Welsh Government of improving health and wellbeing, supporting learning and skills and building stronger communities (111). The initiative is widely implemented in primary and secondary school services for children and young people with disabilities as well as adults. The Football Association of Wales have also launched a wellbeing football hub, to provide clinical, social care, mental healthcare and wellbeing services. These aim to help increase access to PA through football clubs, trained by Mind Cymru and UK Coachingprogrammes which have demonstrated positive impacts on emotional regulation, confidence and social connection (112).

3.2.2 Example case studies in Wales

Curriculum for Wales: The Health and Well-being Area of Learning and Experience includes components of physical health and development, mental health and emotional and social wellbeing. This strategy document outlines mental health as a core component of health and wellbeing, alongside physical health and psychosocial wellbeing. Moreover, Welsh legislation requires that relevant strategies give due regard to the mental health and general wellbeing of children and young people (113). This promotes a whole-school approach encouraging healthy lifestyle practices that include movement and access to mental health support when needed.

This curriculum emphasises that students should be able to regulate emotions and behaviour, build self-awareness, empathy and adapt behaviour based on their own understanding. To support this, educational settings then encouraged discussions about mental health among students, integrating this in learning and personal development sessions (114). As a result, evidence from Welsh Government research and curriculum mapping studies has shown positive impacts on wellbeing, learner engagement, and emotional (115). More recently, the Welsh Health and Social Care committee has dedicated efforts to preventing obesity by ensuring that obesity prevention policies promote early intervention, reduce stigma and incorporate PA into weight management services (116).

The Outdoor Partnership: The Outdoor Partnership supports people to build outdoor activities into their lifestyles, in Wales and other regions in the UK (117). The partnership is a community-based initiative that aims to help improve quality of life, health, social and economic wellbeing through outdoor activities. This offers involvement through participation, education, volunteering and employment. Their initiatives, such as Adventure Therapy and Land to Water Social Prescribing, encourage active participation in PA and discussions about mental health (117). This work helps to mitigate barriers to PA provision. Other activities offered include walking, cycling, climbing, canoeing, paddle-boarding, sailing and adventure sports. The initiative has demonstrated success, with key outcomes including the establishment of 100 new community clubs and engagement of over 13,000 participants.

The Outdoor Partnership supports activities that may be challenging for young people but offers participants the opportunity to build relationships with peers and provides young carers with a space to engage in social activities. Following the COVID-19 pandemic, such outdoor activities have seen increased participation from disadvantaged and underrepresented groups. Their recent Social Impact Report 2024–2025 highlighted positive mental health outcomes linked to participation in PA initiatives (118). Participants reported feeling less isolated and more aware of opportunities for outdoor activities. Their report demonstrates need for investment in social prescribing, which reduces demand on primary care. The report also highlights that these initiatives are measurable and align with the Wellbeing of Future Generations (Wales) Act 2015 (119).

More information about The Outdoor Partnership can be found on the Sport Wales website.

3.2.3 Characteristics of Wales-specific articles

Below are findings from peer-reviewed articles and grey literature sources, specific to settings in Wales. Studies retrieved had varied designs including an RCT, a guidance article, a research study published as a meeting abstract and a review. Out of these, three were delivered in the community or based at leisure centres, with some supported by local authorities. The other studies included a secure setting and primary, secondary and tertiary care. Articles addressed various mental health conditions and one study focused on dementia. Table 1 provides an overview of data extracted including design, type of intervention, setting and outcomes.

Table 1: Data extraction for eligible Wales-specific articles

Authors	Type of article	Setting	Intervention	Mental health diagnosis	Mental health outcomes
Mind (2025)	Guidance document (grey literature source)	Community-based	Any PA for mental health	All mental health concerns Developed with organisations across England and Wales	• Particularly beneficial to people on waiting lists for primary care • Targeted mental health opportunities • Helps 'wait well'
Wade and colleagues (2019)	Review article	Referral from primary, secondary and tertiary care throughout England, Scotland and Wales	13 exercise referral schemes	Various mental health concerns in people from England, Scotland and Wales	• Significant impact noted for several health and wellbeing measures for people referred to exercise schemes; however, most were not clinically meaningful
Meek and Lewis (2012)	Review article	High security prisons	Health promotion objectives	Various mental health concerns among prisoners in secure estates in England and Wales	• Outcomes variable for secure units • Interventions of PA rarely aimed at people with mental health conditions; more provision in juvenile detention centres • Such schemes have shown to reduce the risk of self-harm and suicide as well as increasing self-esteem and motivation to engage in sport
Murphy and colleagues (2012)	Research articles (RCT)	Leisure centres across 12 local health boards	National Exercise Referral Scheme	Mild anxiety, depression or stress in a Welsh population	• Participants reported lower levels of anxiety and depression • Effects depended on adherence

Overview

- Community programmes have been successful in having a positive impact on mental health symptoms (Section 3.2.4).
- Exercise referral schemes have mixed outcomes, with studies reporting moderate outcomes for mental health, but are still being implemented in Wales (Section 3.2.5).
- PA interventions implemented in forensic settings have shown beneficial outcomes (Section 3.2.6).

3.2.4 Physical activity to improve mental health

Community programmes designed to support mental health outcomes play an important role in giving people the guidance and support they need to manage their mental health problems (120). The settings of such programmes can vary by location, activity and support on offer. However, the goal is to ensure that PA is encouraged throughout the programme, with the aim of keeping people who are experiencing mental health problems physically active. Mind (2025) reported that such activities lead to significant reductions in symptoms of anxiety and depression, and improvements in sleep, mood and social connections (120).

That guidance provides examples of how community-led programmes have been delivered independently to support people in their homes, more broadly in the community, through targeted programmes for those experiencing mental health problems, and within primary and secondary care settings (120). For neurodiverse people and individuals with dementia, a targeted approach is recommended (120).

The Dementia Actif Gwynned programme offers PA classes for people living with dementia and their carers (121). This programme is designed to support people with the aim of reducing symptoms of anxiety and depression, while improving quality of life and general wellbeing(87). Findings from the programme highlight the positive impact of a preventive community approach to support carers and reduce the need for admission to acute secondary and residential care.

3.2.5 Physical activity schemes

Exercise referral schemes address patient or population subgroups with chronic conditions (such as coronary heart disease) and mental health conditions and sedentary behaviours by offering contact with qualified PA professionals and tailored programmes promoting PA.

As a means of preventing chronic conditions, Public Health Wales (2023) commissioned a 16-week programme of PA for people referred by health professionals (122). Following the delivery of the programme, a further follow-up is provided with an exercise professional regularly for 8 months, with a 12-month review. This scheme was evaluated for its implementation and effectiveness through an RCT (123), as well as through outcomes reported for England and Scotland in a meta-analysis (123). Both these studies reported varied adherence to the scheme. For instance, it has been reported (123) that only 43% of participants completed all 16 weeks and 59% attended at least one session.

3.2.6 Physical activity in secure settings

Interventions in secure units and prisons that address health needs have been shown to be effective in improving mental health. Such interventions can be described as health promotion initiatives, which include a PA element in treatment plans (124). A review of policies in England and Wales, highlighted that the Department of Health recommends a PA element in interventions to improve mental health outcomes in public prisons and for reducing risk of substance misuse (124). This review highlighted that the intervention with the PA element is mostly available in juvenile facilities. It is noteworthy that the Chartered Society of Physiotherapists reports that PA plays an important role in health promotion across different population groups (125).

Overview of Section 3.2.7

- Community-based PA engagement can be hindered by limited funding, and lack of professional support.
- Facilitators of participating in PA are feedback and support from trained mental health and PA professionals.
- For exercise referral schemes, low adherence, low motivation and lack of relapse strategies require further attention to prevent attrition.
- Individual plans are recommended for people who are unable to participate in group activities, such as those in secure settings, or who have additional health conditions.

3.2.7 Data on engaging in physical activity

Studies describe multiple factors that impede engaging in PA. Context can play a significant role in determining implementation outcomes.

Barriers to engaging in physical activity

For community-based programmes, Mind (2025) reported that funding is limited for targeted mental health and primary care-based PA programmes (120). Continuity and sustainability of such programmes are hindered, as limited funds weaken staff capacity and their ability to respond to challenges. Moreover, lack of professional mental health and professional PA instructors further impact engagement. These programmes depend on people providing accurate and evidence-based information. These programmes may not be appropriate for some settings; for example, for people living with experiences of severe trauma and stigma.

For exercise referral schemes, low adherence meant that participants were less likely to fully engage in training (123). Lack of participation or effort may be related to inappropriate exercises being prescribed (126) and limited relapse prevention strategies further impede participation in the schemes (123). In secure settings, including prisons, poor physical health often acts as a barrier to people's engagement in PA (124). In youth prisons, young people's needs are often overlooked (124).

Facilitators to engaging in physical activity

In community settings, interpersonal skills enable participants to stay engaged with PA and allow them to build peer relationships and social networks (120). Such programmes offer the opportunity to stay connected with the community (127).

Additionally, training delivered by health care professionals and trained PA professionals led to participants feeling effectively supported, thereby reducing ambiguity when accessing sport, PA and movement programmes to support their mental health in different environments (33).

Referring appropriately to a training programme ensured participants were accessing the right form of support (120). Likewise, for people who have experience of exercise referral schemes, recommendation from their GP facilitated their participation in the programme (126). Engagement with referrals has been moderated by self-efficacy and motivation, particularly for people experiencing mental health problems (123).

In prisons, partnership and training with PA professionals allowed individuals to fully participate in the exercise through positive role modelling (124). However, tailored provision for those with varying needs is encouraged (124). Education around PA and non-competitive programmes should be considered when promoting PA programmes (124). Given that some people may have poor physical strength, an individual approach supports people who are unable to participate, or lack the confidence, to do so (120).

Table 2 summarises barriers and facilitators for community-based settings, exercise referral schemes and prisons.

Table 2: Barriers and facilitators for each physical activity intervention setting

Setting	Barriers	Facilitators
Community-based	• Limited funding • Lack of trained professionals • Relevant PA and mental health training	• Interpersonal skills • Social and peer networks • Trained professionals
Exercise referral schemes	• Low adherence • Lack of relapse strategies • Low motivation	• Recommendation from GPs • Appropriate exercise prescription • Physical ability • Feedback from PA professionals
Prisons	• Poor physical and mental health • Poorly trained staff • Low self-efficacy	• Training with professionals • Tailored provision • Education of PA

3.2.8 Methodological quality assessment

We found three studies suitable for quality assessment. One resource (a guidance document) was not suitable for quality assessment given its type of resource.

Studies were appraised using design-matched tools:

- Meek and Lewis (2012) was appraised using the Joanna Briggs Institute (JBI) checklist for Systematic Reviews and Research Syntheses; see Appendix 3 (128).
- Murphy and colleagues (2012) was appraised using the Mixed Methods Appraisal Tool (MMAT) for quantitative RCTs; see Appendix 4 (129).
- Wade and colleagues (2019) was appraised using A Measurement Tool to Assess systematic Reviews 2 (AMSTAR 2); see Appendix 5 (130).

Strengths

Overall, the studies reviewed demonstrated good methodological quality and met most respective checklist criteria. The included studies had clearly stated research questions, which were answered by appropriate data collection and data synthesis methods. Strengths also included robust search strategies, clearly stated inclusion and exclusion criteria, strategies to minimise bias in data extraction, and evidence-based recommendations for policy, practice and future research.

Limitations

Limitations included incomplete reporting of outcome data, absence of publication bias assessments, and unclear reporting of procedures such as pre-registration and data extraction. It was noted that some perceived limitations were beyond expectations for study type. For example, in Meek and Lewis' (2012) review, authors restricted the search to reports published by Her Majesty's Inspectorate of Prisons rather than conducting a broader database search, which was beyond the remit of the study (124). Judgements of methodological quality must be interpreted with consideration to study type.

See Appendix 6 for a summary of the quality appraisal.

4.
Discussion

This report highlights current PA provision in Wales for mental health, positioned within the wider literature. The integrated synthesis and interpretation presented below informed our quality statements.

Community-based activities have been shown to be widely accessible and have significant positive impact on mental health; however, limited funding and lack of trained staff can act as barriers to improved outcomes. Community-based PA programmes are highly effective due to their social components. Peer-based programmes for mental health service users have led to significant increases in perceived social support, enhanced mental wellbeing and improved PA levels (131). The peer-support model, whereby people with shared experiences support one another, fosters a sense of belonging and shared identity, which can mitigate feelings of social isolation and loneliness (132).The informal nature of these activities, as opposed to highly structured, competitive sports, can reduce pressure and encourage sustained participation by making the activity more enjoyable and less intimidating (133).

Wider evidence suggests that green spaces may yield greater psychological benefits than exercising indoors. Participants engaging in outdoor PA reported greater feelings of revitalisation and positive engagement, and decreased tension, anger and depression, compared with people doing the same activity indoors. Natural environments have shown to reduce mental fatigue and improve concentration (133). Exposure to natural light and air can also contribute to mood regulation, by influencing circadian rhythms (134).

4.1 Exercise referral schemes

Exercise referral schemes are ongoing in Wales as reported by Public Health Wales; however, positive outcomes are noted for longer schemes, which are also more cost effective (135). The effectiveness of exercise referral schemes is complex, and findings reported are mixed (126). Numerous peer-reviewed studies and systematic reviews have demonstrated that these schemes can lead to a small but statistically significant increase in PA levels among previously sedentary people, although the long-term sustainability of these gains remains uncertain(126). Participants in exercise referral schemes have reported increased levels of PA compared with those receiving usual care, but evidence for improvements in clinical health outcomes remains limited (135,136).

Successful exercise referral schemes often incorporate key behavioural change components, such as personalised, bespoke support from qualified PA professionals and recommendations from GPs (123,137). Barriers to adherence include personal factors, such as lack of self-efficacy (which may be shaped by protective and adaptive factors), as well as logistical issues, such as inconvenient class times or a lack of social support (138). This underscores the need for schemes to move beyond a prescription model to a more holistic, person-centred approach that addresses individual barriers, and provides ongoing encouragement for people to maintain PA habits beyond formal programmes.

4.2 Secure settings

PA interventions in UK secure mental health units are limited by a complex interplay of institutional and environmental barriers. The restrictions on people and their autonomy, inherent to the security requirements of these settings, are a particular challenge as they, for example, limit access to off-ward activities and outdoor spaces (35). Staffing is another significant barrier: in staff, a lack of availability, confidence and a specific training in exercise promotion can all impede the implementation of PA programmes (35).

The institutional culture itself can also be a barrier, with physical health often being given a subordinate role to mental health treatment. This can create an obesogenic environment in which high-calorie foods are readily available and sedentary behaviour is the norm, further discouraging PA (72).

4.3 Individual factors

Beyond these systemic issues are individual-level factors. Many people in secure units are living with SMI and experience side effects from psychotropic medications, such as lethargy, fatigue and weight gain, which directly reduce motivation and physical capacity to exercise (34). Mental health symptoms such as anhedonia and depression can also make it difficult for people to engage in or enjoy PA. Patient perspectives highlighted that acute mental health symptoms and medication side effects are further barriers (29). This combination of institutional constraints and individual clinical challenges impacts the implementation and sustainability of PA interventions.

For people living with co-occurring conditions (for example, chronic fatigue syndrome and depression), physical activities as graded therapy may exacerbate symptoms (139). Moreover, stigma alongside trauma (including adverse childhood experiences) and chronic pain may exacerbate physical inactivity and impact their quality of life (140). Any PA recommendations would require a referral from a GP for tailored guidance. Sustainable outcomes of PA interventions would then require addressing these mechanisms through trauma-informed, psychologically supported and socially realistic interventions.

4.4 The impact of COVID-19

The literature search process for this report also highlighted the potential impact of the COVID-19 pandemic on PA interventions, as a significant gap was observed in reports of PA interventions during this period. Research shows that even though these programmes were more accessible, remotely delivered PA presented several challenges. These included low motivation as a result of working from home, and safety concerns (141). Since the COVID-19 pandemic, broader literature also suggests that, following patient history and physical examination, appropriate screening is needed to guide patient referrals (142).

5.
Framework for action

This report has identified barriers and facilitators to the implementation of PA-based interventions across a range of Welsh settings. They form this framework (summarised below) calls for cross-sector action to embed PA into mental health care pathways. This is needed to ensure equitable access, effective delivery and sustainable impact.

5.1 Framework summary: recommendations

Re-evaluate length of exercise referral schemes

We recommend that a review of exercise referral schemes (widely used across Wales and other UK regions) is undertaken, to assess their duration and effectiveness. Evidence suggests that longer-term schemes produce better outcomes and can be more cost effective (135).

Involve fitness professionals in implementation design

We recommend that local and community-led interventions in Wales are developed and implemented in close collaboration with PA professionals. Their expertise is essential for safe, effective and person-centred delivery. A consistent barrier across settings is a lack of trained professionals, or the presence of inadequately skilled staff, where as a common facilitator is the involvement of qualified and experienced PA professionals.

Guidance for healthcare providers

We recommend the development of clear guidance for healthcare professionals, to ensure consistency and quality. This can support the implementation of evidence-based practice that is adaptable to local contexts.

Develop and encourage community-led, co-designed practices (including sports teams and clubs)

We recommend that community-led and outdoor activities are developed and encouraged, as they promote engagement and show benefits in enhancing social connectedness and improving mental health outcomes through peer support. Community-based co-produced interventions also contribute to increased mental health literacy, reduced stigma and the development of sustainable support systems. The success of these programmes depends on adequate and sustained funding, particularly for the promotion and delivery of PA initiatives (143).

Consider tailored approach to PA for people with severe mental illness

We recommend that interventions in secure settings (mental health units and prisons) are adapted to meet people's individual physical and psychological needs, while recognising the constraints and sensitivities of these settings. The complexity of care requires a tailored individual approach.

Evaluate the impact of new models to contributing to the evidence gap

We recommend that future public health strategies are culturally sensitive and trauma informed. Evidence shows us that people from minoritised ethnic communities have varied accessibility to opportunities for PA, experience of discrimination (144) and higher disease risk (145).

6.
Strengths, limitations and implications

The multi-method approach adopted in this report is well-suited to public health policy development and implementation science, offering rigour, contextual relevance and practical applicability. However, several limitations should be acknowledged. While there is a substantial body of literature on PA and mental health more broadly, studies specific to the Welsh context remain relatively limited. The quality of the identified studies, however, is considered reasonable to inform meaningful insights and recommendations.

6.1 Further research

That said, there is a need for further research to assess the outcomes of community-based PA interventions in primary care and secondary care settings. The search strategy in this report did not encompass psychosocial and socioeconomic determinants (for example, stigma, trauma, fatigue, and poverty), focus on this in future reviews would ensure that the complexities of barriers are clarified further. In the literature, definitions of PA vary: strengthening the definition would mean future interventions refer to an agreed term that reflects the experiences of the local community.

6.2 The framework

The proposed framework in this report has several implications.

It is hoped that the framework could support improved quality and consistency of interventions, enhance both equity and access and support the long-term sustainability and scalability of PA interventions across Wales.

The framework could be useful for local authorities and health boards, to aid the designing and commissioning of community-based PA and mental health interventions. Recommendations could be used to inform Public Health Wales' and the Welsh Government's policy and funding priorities.

Healthcare professionals and service providers may be particularly interested in guiding the delivery of person-centred provision across settings.

The framework also supports the co-design and implementation of inclusive and locally relevant initiatives for consideration by third sector and community organisations. It encourages researchers and evaluators to address identified gaps in the evidence base for continuous improvement of interventions.

7.
Conclusion

This report highlights the significant potential of PA, particularly when delivered in outdoor and community settings, as an effective intervention for supporting mental health.

Community-led initiatives have shown positive outcomes by fostering social support, peer connection and a sense of belonging. These factors contribute to sustained engagement and improved wellbeing.

Despite promising findings, there is a notable gap in the evidence base concerning the impact of PA on people living with SMI and residing in secure settings in Wales. Nevertheless, research indicates that PA can result in a reduction of negative symptoms and of weight for this population.

Exercise referral schemes continue to be a widely adopted public health intervention to increase PA, particularly for people at risk of long-term health conditions. However, the evidence on their effectiveness is mixed and further research is required to assess their long-term impact on clinical health outcomes.

Overall, this report emphasises the importance of promoting community-led and tailored PA interventions. This should be a key part of the preventive mental health strategy in Wales. Findings support the adoption of the proposed framework for action and encourage stakeholders to commit to the quality statements outlined in this report. Psychological support and compassionate environments are equal drivers of success alongside access and delivery; this is a further recommendation when referring to treatment and schemes. This should help ensure that future interventions are inclusive, evidence-based and sustainable.

Bibliography

1 NICE. Overweight and obesity management. NICE guideline NG246. London: NICE; 2025. Available from: https://www.nice.org.uk/guidance/ng246.

2 World Health Organization. Commercial determinants of health. [Online fact sheet]. Geneva: WHO; 21 March 2023 [cited 2025 Dec 4]. Available from: https://www.who.int/news-room/fact-sheets/detail/commercial-determinants-of-health.

3 Person-Centred Training and Curriculum Scoping Group, Special Committee on Professional Practice and Ethics. Person-centred care: Implications for training in psychiatry. College report CR215. London: Royal College of Psychiatrists [cited 2025 Dec 10]. Available from: https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/college-reports/college-report-cr215.pdf.

4 Public Health England. Severe Mental Illness (SMI) and Physical Health Inequalities: Briefing. [Web page]. Sept 2018. Available from: https://www.gov.uk/government/publications/severe-mental-illness-smi-physical-health-inequalities/severe-mental-illness-and-physical-health-inequalities-briefing

5 Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. Prev Med. 1999 Dec;29(6 Pt 1):563–70.

6 World Health Organization. Physical activity. [Online fact sheet]. Geneva: WHO [cited 2025 Nov 6]. Available from: https://www.who.int/news-room/fact-sheets/detail/physical-activity.

7 The Sedentary Behaviour Research Network. SBRN Terminology Consensus Project. [Web page]. Ottawa: The Sedentary Behaviour Research Network; n.d. [cited 2025 Nov 6]. Available from: https://www.sedentarybehaviour.org/sbrn-terminology-consensus-project/.

8 Kirkbride JB, Anglin DM, Colman I, Dykxhoorn J, Jones PB, Patalay P, et al. The social determinants of mental health and disorder: evidence, prevention and recommendations. World Psychiatry. 2024 Feb;23(1):58–90.

9 Every Mind Matters. [Web page]. London: Office for Health Improvement and Disparities, NHS; 2021 [cited 2026 Jan 14]. Available from: https://www.nhs.uk/every-mind-matters/.

10 Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021 Mar 29;372:n71.

11 Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan-a web and mobile app for systematic reviews. Syst Rev. 2016 Dec 5;5(1):210.

12 His Majesty's Stationery Office. Mental Health Act 2007. London: The Stationery Office; 2007. Available from: https://www.legislation.gov.uk/ukpga/2007/12/contents.

13 His Majesty's Stationery Office. Mental Health Act 1983. London: The Stationery Office; 1983. Available from: https://www.legislation.gov.uk/ukpga/1983/20/contents.

14 Stubbs B, Ma R, Schuch F, Mugisha J, Rosenbaum S, Firth J, et al. Physical Activity and Mental Health: A Little Less Conversation, a Lot More Action. J Phys Act Health. 2024 Oct 1;21(10):963–4.

15 Das-Munshi J, Chang CK, Dregan A, Hatch SL, Morgan C, Thornicroft G, et al. How do ethnicity and deprivation impact on life expectancy at birth in people with serious mental illness? Observational study in the UK. Psychol Med. 2021 Nov;51(15):2581–9.

16 Hjorthøj C, Stürup AE, McGrath JJ, Nordentoft M. Years of potential life lost and life expectancy in schizophrenia: a systematic review and meta-analysis. Lancet Psychiatry. 2017 Apr;4(4):295–301.

17 Firth J, Siddiqi N, Koyanagi A, Siskind D, Rosenbaum S, Galletly C, et al. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. The Lancet Psychiatry. 2019 Aug 1;6(8):675–712.

18 Stubbs B, Vancampfort D, Hallgren M, Firth J, Veronese N, Solmi M, et al. EPA guidance on physical activity as a treatment for severe mental illness: a meta-review of the evidence and Position Statement from the European Psychiatric Association (EPA), supported by the International Organization of Physical Therapists in Mental Health (IOPTMH). Eur psychiatr. 2018 Oct;54:124–44.

19 Eime RM, Young JA, Harvey JT, Charity MJ, Payne WR. A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. Int J Behav Nutr Phys Act. 2013 Aug 15;10:98.

20 Tweed LM, Rogers EN, Kinnafick FE. Literature on peer-based community physical activity programmes for mental health service users: a scoping review. Health Psychology Review. 2021 Apr 3;15(2):287–313.

21 van Rijen D, Ten Hoor GA. A qualitative analysis of facilitators and barriers to physical activity among patients with moderate mental disorders. Z Gesundh Wiss. 2022 Jun 1;1–16.

22 Moore GF, Moore L, Murphy S. Facilitating adherence to physical activity: exercise professionals' experiences of the National Exercise Referral Scheme in Wales. a qualitative study. BMC Public Health. 2011 Dec 15;11(1):935.

23 Williams NH. 'The wise, for cure, on exercise depend': physical activity interventions in primary care in Wales. Br J Sports Med. 2009 Feb;43(2):106–8.

24 Graham M, Hodgson P, Fleming L, Innerd A, Clibbens N, Hope W, et al. Effectiveness of Physical Activity Interventions on Acute Inpatient Mental Health Units on Health Outcomes: A Systematic Review. Int J Ment Health Nurs. 2025 Feb;34(1):e70017.

25 Lewis K, Roden-Lui G, Faulkner G, Gibbon S, Hewitt C, Hughes E, et al. Barriers and facilitators to increasing physical activity in medium secure mental health settings: An exploration of staff perceptions. Ment Health Phys Act. 2025 Mar 1; 28(100663):https://doi.org/10.1016/j.mhpa.2024.100663.

26 Firth J, Rosenbaum S, Stubbs B, Gorczynski P, Yung AR, Vancampfort D. Motivating factors and barriers towards exercise in severe mental illness: a systematic review and meta-analysis. Psychol Med. 2016 Oct;46(14):2869–81.

27 Bell MD, Esat Imal A, Pittman B, Jin G, Wexler BE. The development of adaptive risk taking and the role of executive functions in a large sample of school-age boys and girls. 2019; Available from: https://doi.org/10.1016/j.tine.2019.100120

28 Hickingbotham MR, Wong CJ, Bowling AB. Barriers and facilitators to physical education, sport, and physical activity program participation among children and adolescents with psychiatric disorders: a systematic review. Transl Behav Med. 2021 Sep 15;11(9):1739–50.

29 Rogers E, Papathomas A, Kinnafick FE. Inpatient perspectives on physical activity in a secure mental health setting. Psychology of Sport and Exercise. 2021 Jan 1;52:101827.

30 Vancampfort D, Firth J, Schuch FB, Rosenbaum S, Mugisha J, Hallgren M, et al. Sedentary behavior and physical activity levels in people with schizophrenia, bipolar disorder and major depressive disorder: a global systematic review and meta-analysis. World Psychiatry. 2017 Oct;16(3):308–15.

31 White LK, Moore TM, Calkins ME, Wolf DH, Satterthwaite TD, Leibenluft E, et al. An Evaluation of the Specificity of Executive Function Impairment in Developmental Psychopathology. Journal of the American Academy of Child & Adolescent Psychiatry. 2017 Nov;56(11):975-982.e3.

32 Duncan GE, Avery AR, Tsang S, Williams BD, Seto E. Changes in physical activity levels and mental health during COVID-19: Prospective findings among adult twin pairs. PLOS ONE. 2021 Nov 22;16(11):e0260218.

33 Lederman O, Suetani S, Stanton R, Chapman J, Korman N, Rosenbaum S, et al. Embedding exercise interventions as routine mental health care: implementation strategies in residential, inpatient and community settings. 2017; Available from: http://hdl.cqu.edu.au/10018/1228069

34 Hassan J, Shannon S, Tully MA, McCartan C, Davidson G, Bunn R, et al. Systematic review of physical activity interventions assessing physical and mental health outcomes on patients with severe mental illness (SMI) within secure forensic settings. J Psychiatr Ment Health Nurs. 2022 Oct;29(5):630–46.

35 Rogers E, Anthony J, Papathomas A, Breen K, Kinnafick FE. Educating staff on physical activity promotion in secure psychiatric care: the development of a self-determination theory informed intervention. Archives of Psychiatric Nursing. 2025 Aug 1;57:151909.

36 Morgan K, Lewis J, Hawkins J, Moore G. From a research trial to routine practice: stakeholders' perceptions and experiences of referrals to the National Exercise Referral Scheme (NERS) in Wales. BMC Health Serv Res. 2021 Nov 13;21(1):1232.

37 Oliver EJ, Dodd-Reynolds C, Kasim A, Vallis D, Oliver EJ, Dodd-Reynolds C, et al. Inequalities and Inclusion in Exercise Referral Schemes: A Mixed-Method Multi-Scheme Analysis. International Journal of Environmental Research and Public Health [Internet]. 2021 Mar 15 [cited 2025 Dec 5];18(6). Available from: https://www.mdpi.com/1660-4601/18/6/3033

38 Dolezal BA, Neufeld EV, Boland DM, Martin JL, Cooper CB. Interrelationship between Sleep and Exercise: A Systematic Review. Adv Prev Med. 2017;2017:1364387.

39 Glavin EE, Ceneus M, Chanowitz M, Kantilierakis J, Mendelow E, Mosquera J, et al. Relationships between sleep, exercise timing, and chronotype in young adults. J Health Psychol. 2021 Nov;26(13):2636–47.

40 Bu Z jun, Liu F shuang, Shahjalal M, Song Y ke, Li M chi, Zhuo R er, et al. Effects of various exercise interventions in insomnia patients: a systematic review and network meta-analysis. BMJ Evidence-Based Medicine [Internet]. 2025 Jul 15 [cited 2025 Dec 5]; Available from: https://ebm.bmj.com/content/early/2025/07/09/bmjebm-2024-113512

41 Subotnik KL, McEwen SC, Ventura J, Turner LR, Sturdevant Y, Niess TL, et al. Exercise Predicts a Good Night's Sleep: Preliminary Findings from a UCLA Study of First-Episode Schizophrenia. Behav Sci (Basel). 2023 Jan 21;13(2):88.

42 Teasdale SB, Machaczek KK, Marx W, Eaton M, Chapman J, Milton A, et al. Implementing lifestyle interventions in mental health care: third report of the Lancet Psychiatry Physical Health Commission. The Lancet Psychiatry. 2025 Sep 1;12(9):700–22.

43 Guo J, Liu K, Liao Y, Qin Y, Yue W. Efficacy and feasibility of aerobic exercise interventions as an adjunctive treatment for patients with schizophrenia: a meta-Analysis. Schizophrenia (Heidelb). 2024 Jan 2;10(1):2.

44 Choi KW, Chen CY, Stein MB, Klimentidis YC, Wang MJ, Koenen KC, et al. Assessment of bidirectional relationships between physical activity and depression among adults a 2-sample Mendelian randomization study. JAMA Psychiatry. 2019 Apr;76(4):399.

45 Li L, Zhang Q, Zhu L, Zeng G, Huang H, Zhuge J, et al. Daytime naps and depression risk: a meta-analysis of observational studies. Front Psychol. 2022 Dec 15;13:1051128. doi: 10.3389/fpsyg.2022.1051128.

46 Schug C, Morawa E, Geiser F, Hiebel N, Beschoner P, Jerg-Bretzke L, et al. Social Support and Optimism as Protective Factors for Mental Health among 7765 Healthcare Workers in Germany during the COVID-19 Pandemic: Results of the VOICE Study. Int J Environ Res Public Health. 2021 Apr 6;18(7):3827.

47 Arango C, Dragioti E, Solmi M, Cortese S, Domschke K, Murray RM, et al. Risk and protective factors for mental disorders beyond genetics: an evidence-based atlas. World Psychiatry. 2021 Oct;20(3):417–36.

48 Byrne P. A–Z of Public Mental Health. London: Public Mental Health Implementation Centre, 2023. Available from: https://www.rcpsych.ac.uk/docs/default-source/improving-care/pmhic/a-to-z-of-public-mental-health.pdf

49 Fiorillo A, Sartorius N. Mortality gap and physical comorbidity of people with severe mental disorders: the public health scandal. Ann Gen Psychiatry. 2021 Dec 13;20(1):52.

50 Mahindru A, Patil P, Agrawal V, Mahindru A, Patil P, Agrawal V. Role of Physical Activity on Mental Health and Well-Being: A Review. Cureus [Internet]. 2023 Jan 7 [cited 2025 Dec 8];15(1). Available from: https://cureus.com/articles/121652-role-of-physical-activity-on-mental-health-and-well-being-a-review

51 Kandola AA, Osborn DPJ. Physical activity as an intervention in severe mental illness. BJPsych Advances. 2022 Mar;28(2):112–21.

52 Higueras-Fresnillo S, Cabanas-Sánchez V, García-Esquinas E, Rodríguez-Artalejo F, Martinez-Gomez D. Physical activity attenuates the impact of poor physical, mental, and social health on total and cardiovascular mortality in older adults: a population-based prospective cohort study. Qual Life Res. 2018 Dec;27(12):3293–302.

43 Guo J, Liu K, Liao Y, Qin Y, Yue W. Efficacy and feasibility of aerobic exercise interventions as an adjunctive treatment for patients with schizophrenia: a meta-Analysis. Schizophrenia (Heidelb). 2024 Jan 2;10(1):2.

44 Choi KW, Chen CY, Stein MB, Klimentidis YC, Wang MJ, Koenen KC, et al. Assessment of bidirectional relationships between physical activity and depression among adults a 2-sample Mendelian randomization study. JAMA Psychiatry. 2019 Apr;76(4):399.

45 Li L, Zhang Q, Zhu L, Zeng G, Huang H, Zhuge J, et al. Daytime naps and depression risk: a meta-analysis of observational studies. Front Psychol. 2022 Dec 15;13:1051128. doi: 10.3389/fpsyg.2022.1051128.

46 Schug C, Morawa E, Geiser F, Hiebel N, Beschoner P, Jerg-Bretzke L, et al. Social Support and Optimism as Protective Factors for Mental Health among 7765 Healthcare Workers in Germany during the COVID-19 Pandemic: Results of the VOICE Study. Int J Environ Res Public Health. 2021 Apr 6;18(7):3827.

47 Arango C, Dragioti E, Solmi M, Cortese S, Domschke K, Murray RM, et al. Risk and protective factors for mental disorders beyond genetics: an evidence-based atlas. World Psychiatry. 2021 Oct;20(3):417–36.

48 Byrne P. A–Z of Public Mental Health. London: Public Mental Health Implementation Centre, 2023. Available from: https://www.rcpsych.ac.uk/docs/default-source/improving-care/pmhic/a-to-z-of-public-mental-health.pdf

49 Fiorillo A, Sartorius N. Mortality gap and physical comorbidity of people with severe mental disorders: the public health scandal. Ann Gen Psychiatry. 2021 Dec 13;20(1):52.

50 Mahindru A, Patil P, Agrawal V, Mahindru A, Patil P, Agrawal V. Role of Physical Activity on Mental Health and Well-Being: A Review. Cureus [Internet]. 2023 Jan 7 [cited 2025 Dec 8];15(1). Available from: https://cureus.com/articles/121652-role-of-physical-activity-on-mental-health-and-well-being-a-review

51 Kandola AA, Osborn DPJ. Physical activity as an intervention in severe mental illness. BJPsych Advances. 2022 Mar;28(2):112–21.

52 Higueras-Fresnillo S, Cabanas-Sánchez V, García-Esquinas E, Rodríguez-Artalejo F, Martinez-Gomez D. Physical activity attenuates the impact of poor physical, mental, and social health on total and cardiovascular mortality in older adults: a population-based prospective cohort study. Qual Life Res. 2018 Dec;27(12):3293–302.

53 Sampogna G, Luciano M, Di Vincenzo M, Andriola I, D'Ambrosio E, Amore M, et al. The Complex Interplay Between Physical Activity and Recovery Styles in Patients With Severe Mental Disorders in a Real-World Multicentric Study. Front Psychiatry [Internet]. 2022 Jul 11 [cited 2025 Dec 9];13. Available from: https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsyt.2022.945650/full

54 Sport Wales. School Sport Survey 2022. [Web page]. Cardiff: Sport Wales; 2022. [cited 2026 Feb 9]. Available from: https://www.sport.wales/research-and-insight/school-sport-survey/

55 Public Health Wales. Public Health Wales Decarbonisation Action Plan 2022/24. [Report]. Cardiff: Public Health Wales; [cited 2026 Feb 9]. Available from: https://phwwhocc.co.uk/resources/public-health-wales-decarbonisation-action-plan-2022-24/

56 Co-SPACES. Creating welcoming and safe activity spaces for people with severe mental illness. [Booklet]. (Community) Supporting Physical Activity through Co-production research project; 2025 [cited 2026 Feb 6]. Available from: https://www.spacesproject.co.uk/wp-content/uploads/2026/02/CoSPACES-A5-booklet-print.pdf

57 Marmot M, Allen J, Boyce T, Goldblatt P, Morrison J. Health Equity in England: The Marmot Review 10 Years On. [Report]. London: Institute of Health Equity; 2020. Available from: https://www.health.org.uk/funding-and-partnerships/our-partnerships/health-equity-in-england-the-marmot-review-10-years-on.

58 GOV.UK [Internet]. [cited 2025 Dec 9]. Health disparities and health inequalities: applying All Our Health. Available from: https://www.gov.uk/government/publications/health-disparities-and-health-inequalities-applying-all-our-health/health-disparities-and-health-inequalities-applying-all-our-health

59 Patel NA, Kianoush S, Jia X, Nambi V, Koh S, Patel J, et al. Racial/Ethnic Disparities and Determinants of Sufficient Physical Activity Levels. Kans J Med. 2022 Aug 22;15(2):267–72.

60 Stubbs B, Firth J, Berry A, Schuch FB, Rosenbaum S, Gaughran F, et al. How much physical activity do people with schizophrenia engage in? A systematic review, comparative meta-analysis and meta-regression. Schizophrenia Research. 2016 Oct 1;176(2):431–40.

61 Kruisdijk F, Deenik J, Tenback D, Tak E, Beekman AJ, van Harten P, et al. Accelerometer-measured sedentary behaviour and physical activity of inpatients with severe mental illness. Psychiatry Res. 2017 Aug;254:67–74.

62 Nyboe L, Lund H. Low levels of physical activity in patients with severe mental illness. Nord J Psychiatry. 2013 Feb;67(1):43–6.

63 Álvaro LM, Camilo LS, Jesús BS, Diego MI, Javier BA. Tackling Healthcare Disparities in Severe Mental Disorders: Integrating Physical Activity Therapies and Professionals into Mental Health with the Psychiactive Project. In: Son BWK, editor. The Landscape of Global Health Inequity [Internet]. Cham: Springer Nature Switzerland; 2024 [cited 2025 Sep 25]. p. 209–31. Available from: https://doi.org/10.1007/978-3-031-60502-4_14

64 World Health Organization. World Report on Social Determinants of Health Equity. [Report]. Geneva: WHO; 2025. Available from: https://www.who.int/teams/social-determinants-of-health/equity-and-health/world-report-on-social-determinants-of-health-equity

65 World Health Organization. WHO Housing and Health Guidelines. [Guidance]. Geneva: WHO & Department of Public Health, Environmental and Social Determinants of Health. Available from: https://www.who.int/publications/i/item/9789241550376

66 Institute for Health Metrics and Evaluation. Global Burden of Disease Study. [Data Resource]. Seattle: IHME; 2019. Available from: https://ghdx.healthdata.org/gbd-2019

67 McDonough SM, Howes SC, Dillon M, McAuley J, Brady J, Clarke M, et al. A study protocol for a randomised controlled feasibility trial of an intervention to increase activity and reduce sedentary behaviour in people with severe mental illness: Walking fOR Health (WORtH) Study. Pilot Feasibility Stud. 2021 Nov 15;7(1):205.

68 Spanakis P, Wadman R, Walker L, Heron P, Mathers A, Baker J, et al. Measuring the digital divide among people with severe mental ill health using the essential digital skills framework. Perspect Public Health. 2024 Jan;144(1):21–30.

69 Watkins P. Poverty and mental health: It's a two-way street. [Internet article]. Cardiff: Senedd Wales; Mar 2 2022 [cited 2025 Dec 9]. Available from: https://research.senedd.wales/research-articles/poverty-and-mental-health-it-s-a-two-way-street/.

70 O'Donoghue G, Kennedy A, Puggina A, Aleksovska K, Buck C, Burns C, et al. Socio-economic determinants of physical activity across the life course: A 'DEterminants of DIet and Physical ACtivity' (DEDIPAC) umbrella literature review. PLoS One. 2018 Jan 19;13(1):e0190737.

71 Nour TY, Altintaş KH. Obesity after Natural disasters and Associated Risk Factors: A Systematic Review. Disaster Medicine and Public Health Preparedness. 2025 Jan;19:e8.

72 Faulkner GEJ, Gorczynski PF, Cohn TA. Psychiatric illness and obesity: Recognizing the 'Obesogenic' nature of an inpatient psychiatric setting. Psychiatric Services. 2009;60(4):538–41.

73 Johnson M, Day M, Moholkar R, Gilluley P, Goyder E. Tackling obesity in mental health secure units: a mixed method synthesis of available evidence. BJPsych Open. 2018 Jul 24;4(4):294–301.

74 Carney R, Imran S, Law H, Firth J, Parker S. Physical health interventions on adolescent mental health inpatient units: a systematic review and call to action. Early Interv Psychiatry. 2020;15(3):439–48.

75 Geary RS, Thompson D, Mizen A, Akbari A, Garrett JK, Rowney FM. Ambient greenness, access to local green spaces, and subsequent mental health: a 10-year longitudinal dynamic panel study of 2·3 million adults in Wales. Lancet Planet Health. 2023;7(10):e809–18.

76 Coventry PA, Brown JE, Pervin J, Brabyn S, Pateman R, Breedvelt J, et al. Nature-based outdoor activities for mental and physical health: Systematic review and meta-analysis. SSM Popul Health. 2021 Dec;16:100934.

77 Thompson DA, Geary RS, Rowney FM, Fry R, Watkins A, Wheeler BW, et al. Cohort Profile: The Green and Blue Spaces (GBS) and mental health in Wales e-cohort. Int J Epidemiol. 2022 Oct 13;51(5):e285–94.

78 Pedersen ALW, Lindekilde CR, Andersen K, Hjorth P, Gildberg FA. Health behaviours of forensic mental health service users, in relation to smoking, alcohol consumption, dietary behaviours and physical activity-A mixed methods systematic review. J Psychiatr Ment Health Nurs. 2021 Jun;28(3):444–61.

79 Rabab S, Tomlin J, Huband N, Völlm B. Care quality commission inspections of high-security hospitals. Journal of Forensic Practice. 2020;22(2):83–96.

80 Rimmer A. News: Staff shortages force mental health trusts to cancel patient activities and close wards, says King's Fund. BMJ. 2018;360:k233.

81 Oakley C, Mason F, Delmage E, Exworthy T. A right to be fat? A survey of weight management in medium secure units. J Forensic Psychi Ps. 2013;24(2)205–14.

82 Firth J, Carney R, French P, Elliott R, Yung A. SU106. Investigating the Short- and Long-Term Benefits of Exercise in Early Psychosis. Schizophrenia Bulletin. 2017 Mar 20;43(Suppl 1):S199.

83 Schuch FB, Vancampfort D, Firth J, Rosenbaum S, Ward PB, Silva ES, et al. Physical Activity and Incident Depression: A Meta-Analysis of Prospective Cohort Studies. Am J Psychiatry. 2018 Jul 1;175(7):631–48.

84 Long C, Rowell A, Gayton A, Hodgson E, Dolley O. Tackling obesity and its complications in secure settings. Mental Health Review Journal. 2014;19(1):37–46.

85 Naylor C, Das P, Ross S, Honeyman M, Thompson J, Gilburt H. Bringing Together Physical and Mental Health: A New Frontier for Integrated Care. [Report]. London: The King's Fund; 2016. Available from: https://www.kingsfund.org.uk/insight-and-analysis/reports/physical-mental-health

86 Forsyth N, Elmslie J, Ross M. Supporting healthy eating practices in a forensic psychiatry rehabilitation setting. Nutrition & Dietetics. 2012 Feb 28;69(1):39–45.

87 Davies JL, Bagshaw R, Watt A, Hewlett P, Seage H. Staff perspectives on obesity within a Welsh secure psychiatric inpatient setting. The Journal of Mental Health Training, Education and Practice. 2022 Aug 8;18(1):44–52.

88 Long C, West R, Rigg S, Spickett R, Murray L, Savage P, et al. Increasing physical activity in a secure psychiatric service for women. Mental Health Review Journal. 2015 Sep 14;20(3):144–55.

89 Prebble K, Kidd J, O'Brien A, Carlyle D, McKenna B, Crowe M, et al. Implementing and maintaining nurse-led healthy living programs in forensic inpatient settings: an illustrative case study. J Am Psychiatr Nurses Assoc. 2011;17(2):127–38.

90 Rylance R, Chapman H, Harrison J. Who assesses the physical health of inpatients? Mental Health Practice. 2012;16,2:14–20.

91 Haddad M, Llewellyn-Jones S, Yarnold S, Simpson A. Improving the physical health of people with severe mental illness in a low secure forensic unit: An uncontrolled evaluation study of staff training and physical health care plans. International Journal of Mental Health Nursing. 2016;25(6):554–65.

92 Rodgers M, Dalton J, Harden M, Street A, Parker G, Eastwood A. Integrated Care to Address the Physical Health Needs of People with Severe Mental Illness: A Mapping Review of the Recent Evidence on Barriers, Facilitators and Evaluations. Int J Integr Care. 2018 Jan 25;18(1):9.

93 NHS. Stopping Smoking for Your Mental Health, 2022. [Web page]. London: NHS [reviewed 2024 Jan 10; cited 2025 Dec 9]. Available from: https://www.nhs.uk/live-well/quit-smoking/stopping-smoking-mental-health-benefits/.

94 Maani N, Cl van Schalkwyk M, Petticrew M. Under the influence: system-level effects of alcohol industry-funded health information organizations. Health Promot Int. 2023 Dec 1;38(6):daad167.

95 Dun-Campbell K, Hartwell G, Maani N, Tompson A, van Schalkwyk MC, Petticrew M. Commercial determinants of mental ill health: An umbrella review. PLOS Glob Public Health. 2024 Aug 28;4(8):e0003605.

96 Gilmore AB, Fabbri A, Baum F, Bertscher A, Bondy K, Chang HJ, et al. Defining and conceptualising the commercial determinants of health. The Lancet. 2023 Apr 8;401(10383):1194–213.

97 Public Health England. Severe mental illness (SMI) and physical health inequalities: Briefing. London: Public Health England; 2018 Sep 27 [cited 2025 Aug 12]. Available from: https://www.gov.uk/government/publications/severe-mental-illness-smi-physical-health-inequalities/severe-mental-illness-and-physical-health-inequalities-briefing.

98 Lee A, Cardel M, Donahoo WT. Social and Environmental Factors Influencing Obesity. In: Feingold KR, Ahmed SF, Anawalt B, Blackman MR, Boyce A, Chrousos G, et al., editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000 [cited 2025 Dec 9]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK278977/

99 Kalra S, Verma M, Kapoor N. Commercial determinants of health: A critical component of the obesogenic environment. Clinical Epidemiology and Global Health. 2023 Sep 1;23:101367.

100 Department of Health and Social Care. Restricting promotions of products high in fat, sugar and salt by location and by price: Government response to public consultation. [Consultation outcome]. London: Department of Health and Social Care; 2025 [cited 2025 Dec 9]. Available from: https://www.gov.uk/government/consultations/restricting-promotions-of-food-and-drink-that-is-high-in-fat-sugar-and-salt/outcome/restricting-promotions-of-products-high-in-fat-sugar-and-salt-by-location-and-by-price-government-response-to-public-consultation.

101 Welsh Government. Together for mental health: Our mental health strategy. [Policy document]. Cardiff: Welsh Government; 2012 [cited 2025 Dec 10]. Available from: https://www.gov.wales/together-mental-health-our-mental-health-strategy.

102 Sharp CA, Mackintosh KA, Willmot R, Hughes R, McNarry MA, Milton K. National Policy Response to the United Nations Sustainable Development Goals: A Physical Activity Case Study of Wales. J Phys Act Health. 2022 Apr 1;19(4):316–26.

103 Public Health Wales. Whole School Approach to Emotional and Mental Well-being (WSAEMWB). [Online framework]. Cardiff: Public Health Wales; 2021 [cited 2025 Dec 10]. Available from: https://phw.nhs.wales/topics/promoting-individual-and-community-wellbeing/whole-school-approach-to-emotional-and-mental-well-being-wsaemwb/.

104 Welsh Government. Mental health and wellbeing strategy 2025 to 2035 [Policy document]. Cardiff: Welsh Government; 2025 Apr 30 [cited 2025 Dec 10]. Available from: https://www.gov.wales/mental-health-and-wellbeing-strategy-2025-2035.

105 Welsh Government. Mental health and wellbeing strategy: Delivery plan 2025 to 2028. [Policy document]. Cardiff: Welsh Government; 2025 Apr 30 [cited 2025 Dec 10]. Available from: https://www.gov.wales/mental-health-and-wellbeing-strategy-delivery-plan-2025-2028.

106 Sellars P, Crone D, Mercer J, Clayton D. 130 Promoting health enhancing physical activity through social prescribing in Wales: A delivery and recommendations framework for nature-based wellbeing support programmes. Eur J Public Health. 2024 Sep 26;34(Suppl 2):ckae114.104.

107 Richards AB, Mackintosh KA, Swindell N, Ward M, Marchant E, James M, et al. WALES 2021 Active Healthy Kids (AHK) Report Card: The Fourth Pandemic of Childhood Inactivity. Int J Environ Res Public Health. 2022 Jul 2;19(13):8138.

108 Welsh Parliament. Levelling the Playing Field: A Report on Participation in Sport and Physical Activity in Disadvantaged Areas. [Report]. Cardiff: Welsh Parliament; 2022 Aug. Available from: https://senedd.wales/media/ni2fnoub/cr-ld15305-e.pdf.

109 Welsh Government. Healthy weight strategy (Healthy Weight Healthy Wales), Policy and strategy. [Strategy document]. Cardiff: Welsh Government; 2023 [cited 2026 Feb 9]. Available from: https://www.gov.wales/healthy-weight-strategy-healthy-weight-healthy-wales

110 Cardiff City FC Foundation. [Website] [cited 2025 Dec 10]. Available from: https://cardiffcityfcfoundation.org.uk/.

111 Public Health Wales. Working Together for a Healthier Wales: Our long-term strategy 2023-2025. [Web page]. Cardiff: Public Health Wales; 2023 May [cited 2026 Feb 9]. Available from: https://phw.nhs.wales/about-us/working-together-for-a-healthier-wales/

112 Welsh Government. Welsh football clubs supported to reach mental health goals. [Press release]. Cardiff: Welsh Government; 16 May 2025 [cited 2025 Dec 10]. Available from: https://www.gov.wales/welsh-football-clubs-supported-reach-mental-health-goals.

113 Curriculum and Assessment (Wales) Act 2021. Acts of Senedd Cymru. 2021 asc 4. [Legal act]. [cited 2025 Dec 10]. Available from: https://www.legislation.gov.uk/asc/2021/4/contents

114 Welsh Government. Health and Well-being: 5. Designing your curriculum. [Web page] [cited 2025 Oct 16]. Available from: https://hwb.gov.wales/curriculum-for-wales/health-and-well-being/designing-your-curriculum

115 Welsh Government. Health and Well-being Area of Learning and Experience in the Curriculum for Wales: a qualitative study. Social res. no.: 71/2025. [Report]. Cardiff: Welsh Government; 2025 Jul 17. Available from: https://www.gov.wales/health-and-well-being-area-learning-and-experience-curriculum-wales-qualitative-study.

116 Welsh Parliament Health and Social Care Committee. Prevention of ill health - obesity. October 2025. Cardiff: Welsh Parliament; 2025 Jul 25. Available from: https://laiddocuments.senedd.wales/cr-ld17463-en.pdf.

117 The Outdoor Partnership. [Website] [cited 2025 Dec 10]. Available from: https://outdoorpartnership.co.uk/.

118 The Outdoor Partnership. Social Impact Report 2024-2025. [Report]. Gwynedd: The Outdoor Partnership. Available from: https://www.mantellgwynedd.com/downloads/020525-top-social-impact-report-2024-2025.pdf.

119 Welsh Government. The Well-being of Future Generations. [Web page]. Cardiff: Welsh Government [cited 2025 Oct 16]. Available from: https://www.gov.wales/well-being-of-future-generations-wales.

120 Mind. Safe and effective practice. [Report]. London: Mind; 2025. Available from: https://www.mind.org.uk/media/qk5fhhzq/safe-and-effective-practice-report.pdf.

121 Dementia Actif Gwynedd. [Website] [cited 2025 Dec 10]. Available from: https://www.dementiaactifgwynedd.cymru/en/

122 Public Health Wales. Our Strategic Plan 2023 - 2026. Version 0u 20/03/22. Cardiff: Public Health Wales; 2022 [cited 2025 Dec 18]. Available from: https://phw.nhs.wales/about-us/board-and-executive-team/board-papers/board-meetings/2022-2023/30-march-2023/board-papers-30-march-2023/412a-board-20230330-strategic-plan-imtp-2023-2026/.

123 Murphy SM, Edwards RT, Williams N, Raisanen L, Moore G, Linck P, et al. An evaluation of the effectiveness and cost effectiveness of the National Exercise Referral Scheme in Wales, UK: a randomised controlled trial of a public health policy initiative. J Epidemiol Community Health. 2012 Aug;66(8):745–53.

124 Meek R, Lewis G. The role of sport in promoting prisoner health. Int J Prison Health. 2012;8(3–4):117–30.

125 Chartered Society of Physiotherapy (Cymdeithas Siartredig Ffisiotherapi). Provision of Health and Social Care in the Adult Prison Estate. [Letter from CSP Public Affairs and Policy Officer for Wales to Inquiry, online] [cited 2025 Aug 18]. Available from: https://business.senedd.wales/documents/s90471/HSP13%20-%20Chartered%20Society%20of%20Physiotherapy.html?CT=2.

126 Wade M, Mann S, Copeland RJ, Steele J. The effect of exercise referral schemes upon health and wellbeing: Initial observational insights using individual patient data meta-analysis from The National Referral database. 2019 Jan 12 [cited 2025 Jun 30]; Available from: https://osf.io/yebmr

127 Bell OJ, Flynn D, Clifford T, West D, Stevenson E, Avery L. Identifying behavioural barriers and facilitators to engaging men in a community-based lifestyle intervention to improve physical and mental health and well-being. Int J Behav Nutr Phys Act. 2023 Mar 6;20(1):25.

128 Aromataris E, Fernandez R, Godfrey C, Holly C, Kahlil H, Tungpunkom P. Summarizing systematic reviews: methodological development, conduct and reporting of an Umbrella review approach. International Journal of Evidence-based Healthcare. 2015;13(3):132–40. Available from: https://jbi.global/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Systematic_Reviews2017_0.pdf.

129 Hong QN, Pluye P, Fàbregues S, Bartlett G, Boardman F, Cargo M, et al. Mixed Methods Appraisal Tool (MMAT) Version 2018 User Guide. Hamilton, Ontario: National Collaborating Centre for Methods and Tools. Available from: https://www.nccmt.ca/knowledge-repositories/search/232.

130 Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, et al. AMSTAR 2: A critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. BMJ. 2017;358:j4008. Available from: https://www.bmj.com/content/358/bmj.j4008.

131 Rebar AL, Williams R, Short CE, Plotnikoff R, Duncan MJ, Mummery K, et al. The impact of action plans on habit and intention strength for physical activity in a web-based intervention: is it the thought that counts? Psychol Health. 2025 Apr;40(4):550–70.

132 Lee SL, Pearce E, Ajnakina O, Johnson S, Lewis G, Mann F, et al. The association between loneliness and depressive symptoms among adults aged 50 years and older: a 12-year population-based cohort study. The Lancet Psychiatry. 2021 Jan 1;8(1):48–57.

133 Barton J, Bragg R, Wood C, Pretty JN (eds). Green Exercise: Linking Nature, Health and Well-being. London: Routledge; 2016.

134 Blume C, Garbazza C, Spitschan M. Effects of light on human circadian rhythms, sleep and mood. Somnologie (Berl). 2019;23(3):147–56.

135 Rowley N, Mann S, Steele J, Horton E, Jimenez A. The effects of exercise referral schemes in the United Kingdom in those with cardiovascular, mental health, and musculoskeletal disorders: A preliminary systematic review. BMC Public Health. 2018 Aug;18(1):1–18.

136 Pavey TG, Taylor AH, Fox KR, Hillsdon M, Anokye N, Campbell JL, et al. Effect of exercise referral schemes in primary care on physical activity and improving health outcomes: Systematic review and meta-analysis. BMJ (Online). 2011 Nov;343(7831):980–980.

137 Morgan F, Battersby A, Weightman AL, Searchfield L, Turley R, Morgan H, et al. Adherence to exercise referral schemes by participants-what do providers and commissioners need to know? A systematic review of barriers and facilitators. 2016; Mar 5:16:227. doi: 10.1186/s12889-016-2882-7.

138 Jane B, Lecturer John Downey S, Downey J. Exercise referral schemes in the UK: mapping provision and aims. Lecturer Journal of Public Health |. 2024;46(3):477–82.

139 Vink M, Vink-Niese A. The Updated NICE Guidance Exposed the Serious Flaws in CBT and Graded Exercise Therapy Trials for ME/CFS. Healthcare (Basel). 2022 May 12;10(5):898.

140 Zagaria A, Cerolini S, Mocini E, Lombardo C. The relationship between internalized weight stigma and physical and mental health-related quality of life in a large sample of women: a structural equation modeling analysis. Eat Weight Disord. 2023 Jun 21;28(1):52.

141 Brannon GE, Mitchell S, Ray MA, Bhai S, Beg MS, Basen-Engquist KM, et al. A Qualitative Examination of COVID-19's Impacts on Physical Activity and Perceptions of Remote Delivery Interventions. Am J Health Promot. 2022 Mar 1;36(3):472–6.

142 Jimeno-Almazán A, Franco-López F, Buendía-Romero Á, Martínez-Cava A, Sánchez-Agar JA, Sánchez-Alcaraz Martínez BJ, et al. Rehabilitation for post-COVID-19 condition through a supervised exercise intervention: A randomized controlled trial. Scandinavian Journal of Medicine & Science in Sports. 2022;32(12):1791–801.

143 McGinty EE, Alegria M, Beidas RS, Braithwaite J, Kola L, Leslie DL, et al. The Lancet Psychiatry Commission: transforming mental health implementation research. The Lancet Psychiatry. 2024 May;11(5):368–96.

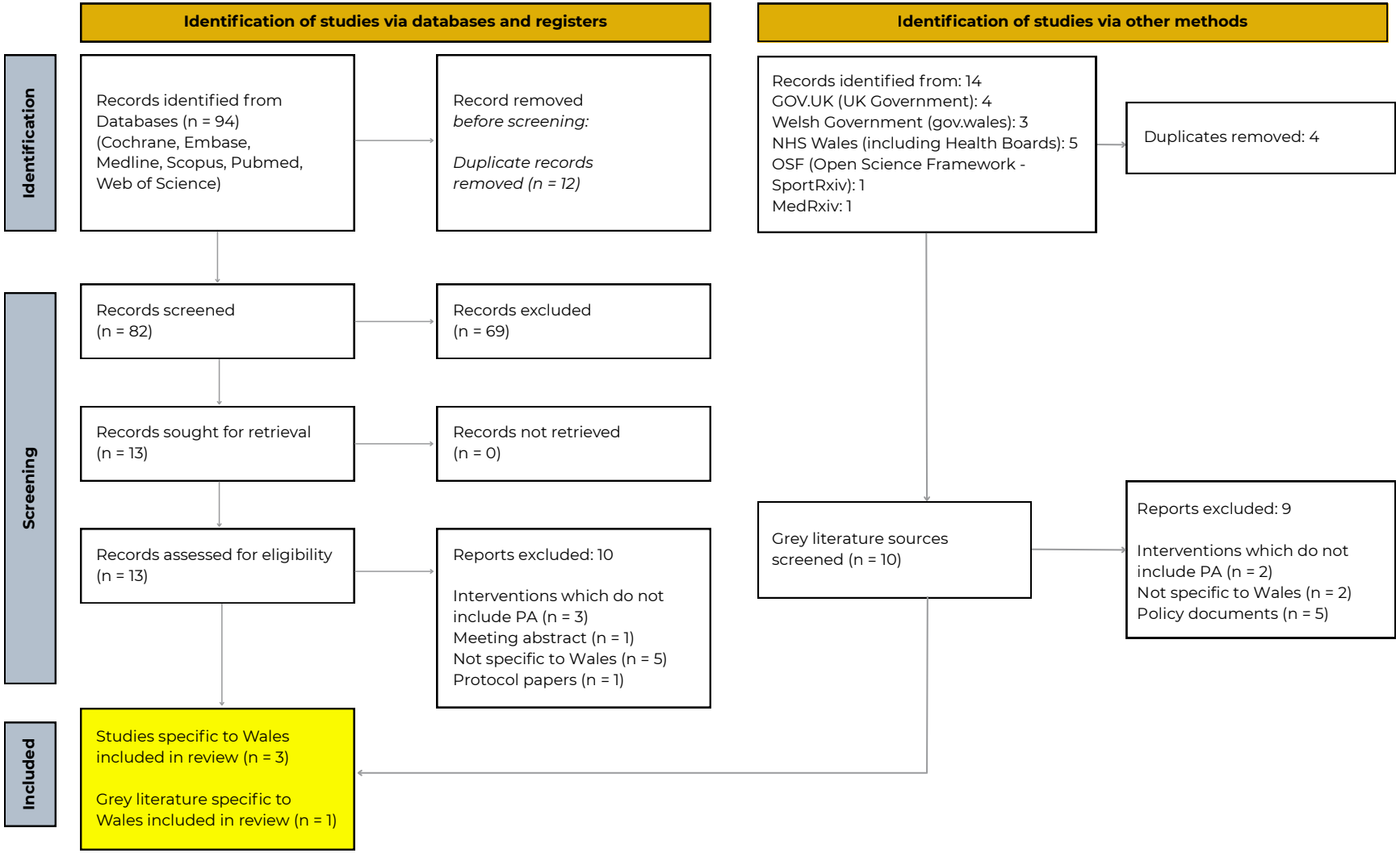
144 Mota H. Minority communities are edged out of the UK's green spaces. I'm trying to change that. The Guardian [Internet]. 2023 Oct 2 [cited 2025 Dec 10]; Available from: https://www.theguardian.com/commentisfree/2023/oct/02/minority-communities-uk-green-spaces-nature-racial-disparities

145 Celis-Morales CA, Ghouri N, Bailey MES, Sattar N, Gill JMR. Should Physical Activity Recommendations Be Ethnicity-Specific? Evidence from a Cross-Sectional Study of South Asian and European Men. PLOS ONE. 2013 Dec 11;8(12):e82568.

Appendices

Appendix 1 PRISMA diagram

Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) diagram.



Appendix 2 PICO formulation and search terms for Section 5

Population, Intervention, Comparison and Outcome (PICO) formulation and search terms.

Population / Patient / Problem	Intervention	Outcome
Welsh patients living with mental health conditions or severe mental illness (SMI)	PA Interventions	• Key features of PA interventions. • Barriers and facilitators to PA interventions.
(Wales, Welsh, Cymru) AND (Secure unit, low secure, medium secure, high secure, inpatient wards, wards; Psychiatric intensive care; primary care, secondary care, tertiary care) AND (Mental disorders; Severe mental disorders; Psychiatric disease; Mental disorder; Psychiatric disorders; Psychiatric illnesses; Psychiatric diseases; Psychiatric illness; Mental illness; Illness, mental; Psychiatric diagnosis; Diagnosis, psychiatric; Mental health conditions, neurodiversity)	(Physical activity, exercise, Aerobic exercise; Physical exercise, movement) AND (Interventions, psychological; Interventions, psychosocial; Intervention, psychological; Psychosocial interventions; Intervention, psychosocial; Psychological intervention; module, treatment, protocol) OR (Mental Health Interventions, Interventions, Psychological; Interventions, Psychosocial; Intervention, Psychosocial)	Barriers, challenges, limitations, deterrents, low mood, stress, lack of support, prevent AND Facilitators, enablers, adherence, encourage, adoption, maintenance, motivation, promoting PA, losing weight, improved mood, reduced stress Implementation, implementation factors

Appendix 3 Quality assessments using the JBI checklist

Joanna Briggs Institute (JBI) critical appraisal checklist for systematic reviews and research syntheses, used in the appraisal of:

Meek R, Lewis G. The role of sport in promoting prisoner health. International Journal of Prisoner Health. 2012:8;117–30. https://doi.org/10.1108/17449201211284996

JBI critical appraisal checklist items	Yes	No	Unclear	N/A
Is the review question clearly and explicitly stated?				
Were the inclusion criteria appropriate for the review question?				
Was the search strategy appropriate?				
Were the sources and resources used to search for studies adequate?				
Were the criteria for appraising studies appropriate?				
Was critical appraisal conducted by two or more reviewers independently?				
Were there methods to minimize errors in data extraction?				
Were the methods used to combine studies appropriate?				
Was the likelihood of publication bias assessed?				
Were recommendations for policy and/or practice supported by the reported data?				
Were the specific directives for new research appropriate?				

Appendix 4 Quality assessments using the MMAT

Quality assessment using the Mixed Methods Appraisal Tool (MMAT; v2018), used in the assessment of:

Murphy SM, Edwards RT, Williams N, Raisanen L, Moore G, Linck P, et al. An evaluation of the effectiveness and cost effectiveness of the National Exercise Referral Scheme in Wales, UK: A randomised controlled trial of a public health policy initiative. Journal of Epidemiology and Community Health. 2012;66(8): 745–53. doi: https://doi.org/10.1136/jech-2011-200689

Question	Yes / No / Can't tell
S1. Are there clear research questions?	Yes
S2. Do the collected data allow to address the research questions?	Yes
2.1. Is randomization appropriately performed?	Yes
2.2. Are the groups comparable at baseline?	Yes
2.3. Are there complete outcome data?	Can't tell: Some data missing at 12-month follow-up
2.4. Are outcome assessors blinded to the intervention provided?	Yes
2.5 Did the participants adhere to the assigned intervention?	Yes

Appendix 5 Quality assessments using AMSTAR 2

A Measurement Tool to Assess systematic Reviews (AMSTAR 2), and responses as applied in the assessment of:

Wade M, Mann S, Copeland RJ, Steele J. Effect of exercise referral schemes upon health and well-being: initial observational insights using individual patient data meta-analysis from the National Referral Database. J Epidemiol Community Health. 2020 Jan;74(1):32–41. doi: 10.1136/jech-2019-212674.

AMSTAR 2 items	Our responses
1. Did the research questions and inclusion criteria for the review include the components of PICO [Patient, problem or population; Intervention; Comparison, control or comparator; Outcome/s]?	Yes
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?	No
3. Did the review authors explain their selection of the study designs for inclusion in the review?	Yes
4. Did the review authors use a comprehensive literature search strategy?	Yes For the purpose of their review, they looked at the National Referral Database
5. Did the review authors perform study selection in duplicate?	No Information not available
6. Did the review authors perform data extraction in duplicate?	No Information not available
7. Did the review authors provide a list of excluded studies and justify the exclusions?	Yes
8. Did the review authors describe the included studies in adequate detail?	Yes

Continued

AMSTAR 2 items	Our responses
9. Did the review authors use a satisfactory technique for assessing risk of bias (RoB) in individual studies?	No
10. Did the review authors report on the sources of funding for included studies?	Yes
11. If meta-analysis was performed, did the review authors use appropriate methods for statistical combination of results?	Yes
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB?	No
13. Did the review authors account for RoB in interpretation/discussion?	No
14. Did the review authors explain and discuss any heterogeneity?	Yes
15. If quantitative synthesis was performed, did the review authors investigate publication bias?	No
16. Did the review authors report potential conflicts of interest, including funding?	Yes

Appendix 6 Summary of quality appraisal

Population / Patient / Problem	Appraisal tool	Strengths	Limitations
Wade and colleagues (2019)	AMSTAR 2	• Clear objectives, and adequate justification for study design • Inclusion and exclusion criteria • Results were discussed with appropriate consideration to limitations • Appropriate methods were used for statistical combination in the meta-analysis • Heterogeneity statistics were also presented • Authors reported on sources of funding and there were no conflicts of interest	• Unclear whether the study was pre-registered • Database analysis, so evaluation of comprehensive search strategy (across databases) and risk of bias assessments were not applicable • Unclear information on duplication in study selection and data extraction
Meek and Lewis (2012)	JBI	• Explicitly stated research question • Clear inclusion criteria • Appropriate search strategy • Appropriate appraisal criteria and appraisal procedures • Methods to minimise errors in data extraction • Results combined in line with research question and evidence-based recommendation	• Publication bias not assessed

Continued

Population / Patient / Problem	Appraisal tool	Strengths	Limitations
Murphy and colleagues (2012)	MMAT	• Clear research question, inclusion criteria • Appropriate search criteria and adequate resources • Randomisation • Groups comparable at baseline • Outcome assessors were blinded to intervention provided • Participants adhered to the assigned intervention	• Complete outcome data not reported

Cite as: Public Mental Health Implementation Centre. Physical activity for mental health: A framework for action in Wales. London: Public Mental Health Implementation Centre; 2026.