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PHYSICAL ACTIVITY AND MENTAL HEALTH: PUBLIC HEALTH PERSPECTIVES ON PREVENTION AND PROMOTION

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Abstract

Physical activity is increasingly recognised as a cornerstone of mental health promotion and psychiatric disorder prevention. This article examines the evidence linking regular physical activity to improved mental health outcomes, drawing on epidemiological, clinical, and mechanistic research published between 2015 and 2025. A public health lens is applied to explore population-level strategies for increasing participation in physical activity, with particular emphasis on addressing health inequalities, implementing community-based interventions, and reforming policy frameworks. Findings indicate that even moderate levels of physical activity confer significant benefits across a range of mental health conditions, including depression, anxiety, and stress-related disorders. The article concludes by identifying key gaps and proposing a multilevel approach to embedding physical activity within national mental health strategies.

Keywords: *physical activity, mental health, public health, prevention, health promotion, well-being*

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INTRODUCTION

Mental health disorders represent one of the most significant and growing burdens on public health systems worldwide. According to the World Health Organisation (WHO, 2022), depression is the leading cause of disability globally, whilst anxiety disorders affect an estimated 264 million individuals. In the United Kingdom alone, one in four adults experiences a mental health problem in any given year, placing considerable strain on National Health Service (NHS) resources (NHS England, 2021). Despite advances in pharmacological and psychological treatments, there remains a compelling need for accessible, low-cost, population-level interventions that can be deployed at scale.

Physical activity has emerged as one of the most promising such interventions. A growing body of evidence suggests that regular engagement in physical activity is associated with reduced prevalence and severity of common mental disorders, enhanced psychological well-being, and protective effects against cognitive decline (Stubbs et al., 2017). Crucially, these benefits are not confined to clinical populations; they extend across the general population, underscoring the relevance of physical activity as a public health strategy (Mammen & Faulkner, 2019). Yet despite this evidence, physical inactivity remains alarmingly prevalent. In England, only 66% of men and 58% of women meet the Chief Medical Officers' guidelines for physical activity, with rates significantly lower among older adults, those living in deprivation, and ethnic minority communities (Sport England, 2023).

This article synthesises current evidence on the relationship between physical activity and mental health, situates this relationship within a public health framework, and examines strategies for promoting physical activity at the population level. It draws upon epidemiological data, mechanistic research, and policy analyses to offer a comprehensive perspective on prevention and promotion.

The Evidence Base: Physical Activity and Mental Health Outcomes

Depression and Anxiety

The association between physical activity and reduced symptoms of depression is among the most robustly supported in mental health research. Schuch et al. (2016) conducted a large meta-analysis of 25 randomised controlled trials and reported that exercise produced significant reductions in depressive symptoms compared with control conditions, with effect sizes ranging from moderate to large. Importantly, the benefits were observed across a variety of exercise modes, including aerobic exercise, resistance training, and mind-body practices such as yoga and tai chi. More recently, Singh et al. (2023) updated the evidence base with a comprehensive umbrella review of 97 systematic reviews and concluded that physical activity was more effective than usual care and comparable to antidepressant pharmacotherapy for mild-to-moderate depression.

With respect to anxiety, the evidence is similarly compelling. Gordon et al. (2017) demonstrated that structured exercise programmes produced significant reductions in anxiety symptoms in both healthy individuals and those with clinical anxiety disorders. Notably, high-intensity interval training (HIIT) appeared particularly efficacious, suggesting a dose-response relationship that warrants further investigation. Additionally, Kandola et al. (2018) found in a longitudinal study of over 33,000 adults that higher levels of leisure-time physical activity were associated with substantially lower odds of developing depression and anxiety over an 11-year follow-up period, reinforcing the preventive potential of habitual movement.

Stress, Resilience, and Well-Being

Beyond clinical disorders, physical activity exerts favourable effects on sub-clinical psychological states including perceived stress, emotional resilience, and subjective well-being. Steptoe and Kivimäki (2016) identified physical activity as a key moderator of the cortisol stress response, with active individuals demonstrating more adaptive neuroendocrine profiles following psychosocial stressors. This biological buffering effect may partially explain why physically active individuals report higher levels of positive affect and life satisfaction (Richards et al., 2015).

Furthermore, physical activity appears to promote social connectedness and self-efficacy, constructs that are strongly protective against psychological distress. Group-based activities, in particular, afford opportunities for social interaction and community engagement that may independently support mental health, a consideration of particular relevance for public health interventions targeting social isolation (Leavell et al., 2019).

Mechanistic Pathways

Understanding the biological and psychosocial mechanisms through which physical activity confers mental health benefits is essential for optimising intervention design. At the neurobiological level, exercise stimulates the release of monoamine neurotransmitters, including serotonin, dopamine, and noradrenaline, which are central to the regulation of mood and affect (Craft & Perna, 2015). Physical activity also upregulates brain-derived neurotrophic factor (BDNF), a protein critical for neuroplasticity, neurogenesis, and the maintenance of cognitive function. Elevated BDNF levels following exercise have been linked to improvements in memory, executive function, and depressive symptomatology (Szuhany et al., 2015).

The hypothalamic-pituitary-adrenal (HPA) axis, which governs the physiological stress response, is also modulated by habitual physical activity. Chronic exercise training attenuates HPA reactivity, reducing cortisol secretion in response to stressors and thereby fostering greater psychological resilience (Hackney, 2016). Additionally, exercise promotes anti-inflammatory processes, with evidence indicating that regular physical activity reduces circulating levels of pro-inflammatory cytokines such as interleukin-6 (IL-6) and tumour necrosis factor-alpha (TNF-α), both of which have been implicated in the pathophysiology of depression (Gleeson et al., 2021).

Psychologically, mechanisms such as self-efficacy enhancement, distraction from ruminative thought, and the fulfilment of basic psychological needs for autonomy, competence, and relatedness (as conceptualised in self-determination theory) contribute to the mental health benefits of physical activity

(Teixeira et al., 2020). These pathways underscore the importance of designing interventions that not only increase physical activity volume but also foster intrinsic motivation and a sense of personal agency.

Public Health Approaches to Promotion and Prevention

Policy and National Strategy

Effective promotion of physical activity for mental health requires coordinated action at the policy level. In the United Kingdom, the NHS Long Term Plan (2019) identified physical activity as a priority for prevention and committed to integrating social prescribing, including referrals to physical activity programmes, into primary care pathways. The Chief Medical Officers' Physical Activity Guidelines (UK Chief Medical Officers, 2019) recommend that adults engage in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity activity per week, with additional guidance on strength training and minimising sedentary behaviour. These guidelines explicitly acknowledge the mental health benefits of physical activity, representing an important step in mainstreaming the evidence base.

Nevertheless, implementation gaps persist. Hallgren et al. (2020) highlighted that policy commitments to physical activity promotion are frequently undermined by inadequate funding, fragmented commissioning structures, and the absence of robust monitoring frameworks. A whole-systems approach, in which physical activity is embedded across transport, urban planning, education, and healthcare policy domains, is increasingly advocated as a means of creating environments that facilitate movement as the default rather than the exception (Rutter et al., 2017).

Community-Based and Social Prescribing Interventions

Community-based physical activity interventions represent a pragmatic and scalable approach to mental health promotion. Programmes such as Parkrun, Walking for Health, and community exercise classes have demonstrated positive effects on psychological well-being and social inclusion, particularly for socially isolated and economically disadvantaged populations (Roberts et al., 2020). The social prescribing model, whereby general practitioners and allied health professionals refer patients to non-clinical community resources including physical activity, has gained considerable traction in England, with a National Academy for Social Prescribing established in 2019 to support its expansion.

Evidence for social prescribing's effectiveness is growing. Drinkwater et al. (2022) conducted a systematic review and found that social prescribing interventions incorporating physical activity were associated with significant improvements in mental well-being, loneliness, and self-reported quality of life. Critically, such approaches can reach individuals who may not present to conventional mental health services, offering an early-intervention pathway that complements clinical treatment.

Addressing Health Inequalities

A fundamental principle of public health is equity, and any strategy to promote physical activity for mental health must explicitly address the social determinants that constrain participation. Physical inactivity is disproportionately prevalent among those living in poverty, those with lower educational attainment, older adults, women, and several ethnic minority groups (Sport England, 2023). These same populations also bear a disproportionate burden of mental ill-health, suggesting that targeted, culturally sensitive interventions could simultaneously address multiple public health priorities.

The concept of proportionate universalism, articulated by Marmot et al. (2020), offers a useful framework: universal interventions should be designed and scaled in proportion to the degree of disadvantage, rather than adopting a one-size-fits-all approach. This may involve investing in safe, accessible green spaces in deprived communities, subsidising leisure centre memberships, delivering physical activity programmes in community languages, or training peer health advocates to promote movement within underserved communities.

Challenges and Future Directions

Despite the considerable promise of physical activity as a public health intervention for mental health, several challenges warrant acknowledgement. Methodological heterogeneity across studies, including variability in outcome measures, intervention designs, and follow-up periods, complicates definitive

conclusions about optimal dose, type, and setting (Rebar et al., 2015). The direction of causality in observational research also remains contested, as it is plausible that poor mental health leads to physical inactivity rather than the converse, a challenge that requires longitudinal and experimental designs to address.

Engagement and adherence to physical activity programmes present a further challenge, particularly among those with severe mental illness, for whom motivational, cognitive, and logistical barriers may be most pronounced. Collaborative care models that integrate mental health support with physical activity promotion, and that draw upon behaviour change theory to foster sustained engagement, are likely to be most effective (Firth et al., 2017). Digital health technologies, including smartphone applications and wearable devices, hold potential for extending the reach of physical activity interventions and enabling personalised approaches, though concerns about the digital divide and data privacy must be addressed.

Future research should prioritise long-term follow-up studies to establish the durability of mental health benefits, intervention research in under-represented populations, and economic evaluations to support the business case for investment in physical activity promotion. Implementation science approaches are also needed to understand how effective interventions can be scaled and sustained within real-world public health systems (Sallis et al., 2016).

CONCLUSION

Physical activity represents one of the most potent, accessible, and cost-effective tools available to public health practitioners and policymakers seeking to reduce the burden of mental ill-health. The evidence base is compelling, spanning multiple mental health conditions, diverse population groups, and a range of biological and psychosocial mechanisms. Yet translating this evidence into sustained population-level behaviour change requires systemic action: robust policy commitment, equitable investment in community infrastructure, innovative and inclusive intervention models, and a genuine commitment to addressing the social determinants of both inactivity and mental ill-health.

In the post-pandemic era, in which rates of depression, anxiety, and loneliness have heightened across the population, the imperative to act has never been greater. A public health approach that places physical activity at the heart of mental health strategy, supported by cross-sectoral collaboration and grounded in equity, offers a meaningful pathway toward a healthier, more resilient population.

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