

Integrated Physical Activity and Mental Health Interventions for Often Ignored Youth (IMPAct): A Mixed Methods Systematic Review

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Abstract

Introduction:

The rising prevalence of childhood obesity and increasing demand for mental health support represent a growing public health concern. Regular physical activity is associated with wide-ranging mental and physical health benefits. Yet, participation in physical activity continues to reflect existing social and structural inequalities. This systematic review assessed the effectiveness of integrated physical activity and mental health interventions for often ignored youth, and identified key barriers and facilitators for effective implementation.

Methods

Seven databases were searched to cover multidisciplinary fields. All empirical and grey literature involving young people (aged 16–25) from often ignored communities, including qualitative and quantitative methodologies, were eligible for inclusion. Studies screened implemented interventions that combined physical activity and mental health elements into one intervention. Studies were screened independently by two reviewers. Results were synthesized in partnership with young people from often ignored communities.

Results

Searches yielded 2,293 records, with 1,624 unique records screened. Seven studies met the inclusion criteria, comprising six quantitative studies and one mixed-methods feasibility study. Six of seven studies rated high risk of bias. Due to substantial between-study heterogeneity, data was synthesised narratively using the Synthesis Without Meta-analysis approach. The most consistent evidence of benefit was found for depression and anxiety, with two studies reporting small-to-moderate effects ($d = 0.41–0.50$), though evidence for physical activity, resilience, and social or community outcomes was inconsistent. Qualitative evidence highlighted social connection, a sense of safety, and routine as valued aspects of intervention engagement, alongside logistical and structural barriers to sustained participation.

Conclusions

The evidence for integrated physical activity and mental health interventions in often ignored young people remains limited, methodologically weak, and insufficient to support firm conclusions about effectiveness. Future research should prioritise more rigorous study designs, consistent outcome reporting, and qualitative exploration of engagement and acceptability, co-designed with often ignored young people themselves.

Introduction

Current NHS England estimates indicate that approximately one in five children and young people experienced ill mental health, including depression or anxiety¹. Evidence suggests that young people who come from vulnerable, marginalised or often ignored populations with limited economic, social, and political power are of disproportionately higher risk for experiencing mental health problems². These young people usually come from racial/ethnic minorities, rural or low socioeconomic areas and what makes them more susceptible to ill mental health are issues including discrimination, poverty, greater childhood adversity, single-parent family structures, less access to mental health treatment, and social-structural barriers³. Additionally, individuals from Black ethnic diaspora (including Black Caribbean, Black African, and unspecified Black backgrounds) face a higher likelihood of involuntary hospital admissions and an elevated risk of being readmitted to the hospital⁴. These disparities are complex and multifactorial, arising from broader inequities both within and outside the healthcare system. Contributing factors include bias, discrimination, and racism against Black individuals, as well as stigma and inadequate recognition of mental illness symptoms^{5,6}.

Physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure⁷. This includes movements during leisure time, commuting, or while performing work or household tasks. Research suggests that regular physical activity is associated with numerous benefits, including a significant reduction in cardiovascular disease and all-cause mortality, as well as improvements in quality of life^{8,9}. Physical activity has also been shown to be effective in reducing symptoms of ill mental health while exerting protective effects that may lower the incidence of mental health conditions such as depression and psychosis^{10,11}. Despite substantial advances in physical activity research over recent decades, there has been little change in overall activity levels within the general population^{12,13}, while prevalence of obesity among young people has increased exponentially¹⁴.

Similarly to mental health inequalities, there is strong research evidence that social structural factors and their intersections significantly shape health risks, outcomes, and mortality¹⁵. Although physical activity is generally linked to better health, wellbeing, and academic performance, it also mirrors existing social and structural inequalities¹⁶. People from often ignored backgrounds and/or ethnic minority communities are consistently reported to engage in lower levels of physical activity compared to individuals from either wealthier or ethnic majority groups¹⁵. These individuals also face unique challenges and barriers that make it harder for them to engage in sufficient activity to gain health benefits¹⁷. Moreover, an essential step towards promoting health equity is to understand and address these obstacles.

Preliminary qualitative findings of the Co-STARS project, conducted in collaboration with young people from Black ethnic communities in Birmingham, suggest that young people from often ignored communities often distrust formal support systems due to fears of being misinterpreted, criminalised, or referred to services because of their mental health challenges¹⁸. Rather than expecting young people to engage with formal support that feels alienating, early intervention programmes that combine physical activity with mental health support should be brought into the spaces these young people already trust and engage with. This may help young people view these sessions as accessible opportunities to seek

support for their mental health and wellbeing. Hereafter, this type of intervention will be referred to as an 'integrated physical activity and mental health intervention'.

To our knowledge, little is known about what integrated physical activity and mental health interventions currently exist, whether they are effective, and whether they are designed with often ignored communities in mind. Therefore, we conducted a mixed methods systematic review to capture both the quantitative evidence on intervention effectiveness and the qualitative evidence on young people's experiences and perspectives. A conventional systematic review would overlook for whom, in what contexts, and why these interventions work. To do so, this review addresses four questions:

1. What integrated physical activity and mental health interventions have been implemented among often ignored young people?
2. What is the effectiveness of these interventions in improving physical and mental health outcomes?
3. What are the experiences and perspectives of often ignored young people in engaging with these interventions?
4. What barriers and enablers affect their implementation and engagement?

Methods

This research was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidance¹⁹ (Page et al., 2021), and JBI methodology for convergent segregated mixed methods systematic review²⁰. Due to heterogeneity within selected studies, results were reported in accordance with the Synthesis Without Meta-analysis guideline²¹.

Protocol and registration

The review protocol was developed and registered on PROSPERO on 7th October 2025 [CRD420251105259]; see here: <https://www.crd.york.ac.uk/PROSPERO/view/CRD420251105259>.

Information sources and search strategy

An initial limited search of Ovid MEDLINE was conducted from inception to 14 August 2025 to identify relevant articles and inform the development of the full search strategy. Titles, abstracts, and index terms from the retrieved articles were examined and subsequently refined in consultation with a subject librarian from the University of Birmingham. The finalised search strategy was built around five conceptual domains: physical activity, mental health intervention components, mental health outcomes, age, and often ignored populations. Studies focusing exclusively on elite or professional athletes, or on obesity as a primary outcome, were excluded. The full search was conducted in October 2025 across seven electronic bibliographic databases: MEDLINE, Embase, APA PsycINFO, Scopus, The Cochrane Library, Sport Medicine and Education Index, and SPORTDiscus. The full search strategies for each database can be found in Supplementary Appendix 1.

To supplement electronic database searches, backwards citation tracking was conducted on all systematic reviews identified during full-text screening. Grey literature and unpublished studies were also sought, including doctoral theses, community initiatives, and experts and early career researchers in the field were contacted to request access to any relevant unpublished materials. The Cochrane Library search additionally identified a number of trial registrations for ongoing studies; the principal investigators of each were contacted directly to enquire whether any relevant unpublished data were available.

Eligibility criteria

We included studies involving young people aged 16 to 25 from often ignored communities, defined as individuals from global majority or ethnic minority populations living in deprived areas who face social, economic, or structural barriers to healthcare, education, or basic resources. We chose this age range because this is a key transitional period in which young people experience significant changes in education, employment, and independence, while also facing an increased risk of developing mental health difficulties and navigating the transition between child and adult services. Eligible interventions delivered in community settings including schools, youth centres, after-school clubs, or drop-in services were required to integrate physical activity (e.g. exercise, sport, movement-based programmes) with a mental health component, such as emotional literacy, resilience-building, psychosocial support or mindfulness. Studies were required to report on at least one mental health outcome (e.g. depression, anxiety, emotional wellbeing, self-esteem, or resilience), or on process outcomes such as feasibility, acceptability, barriers, or facilitators to implementation.

Both quantitative and qualitative study designs were eligible, including randomised and non-randomised controlled trials, quasi-experimental, pre-post, observational, and qualitative studies, as well as mixed methods studies. Studies published from 1975 onwards in peer-reviewed journals or as grey literature were included.

Studies were excluded if they focused on clinical treatment of existing mental illness, required specialist psychiatric diagnosis or referral for participation, were conducted in inpatient settings, lacked either a physical activity or mental health component, targeted elite athletes, or involved populations not meeting our definition of often ignored (please see above for definition).

Study selection

The database search records were combined and imported into Zotero version 7 for initial deduplication²², then transferred to Covidence for a second deduplication pass²³. Prior to independent screening of abstracts, two reviewers (M.A. and H.C.) piloted the eligibility criteria on the first 50 records to establish inter-rater agreement. Full-text screening was also conducted independently by two reviewers (M.A. and B.V.M.). Any disagreements at either screening stage were resolved through discussion between reviewers or in consultation with supervisors (B.I.P. and S.L.G.).

Quality assessment

Study quality of all included studies was assessed independently by two reviewers (M.A. and S.G.L.) using the Mixed Methods Appraisal Tool²⁴. This tool is used in systematic reviews to assess the methodological quality and overall rigour of studies, including quantitative, qualitative, and mixed-methods research.

Data extraction

Data were extracted by two independent reviewers (M.A. and S.G.L.) using the extraction tool developed for this review. This tool captured study and population characteristics (including study design, country, setting, sample size, age, gender, ethnicity, and socioeconomic indicators) and intervention characteristics (including physical activity type, intensity, frequency, and duration, alongside the mental health component, facilitator type, delivery mode, and fidelity). For quantitative studies, additional data were extracted on outcome domains, measurement tools, and scores at baseline and follow-up timepoints. For qualitative studies, the tool additionally recorded analysis method, key themes and illustrative quotes, and authors' interpretation of findings. Whereas for mixed methods studies, the tool recorded the mixed methods design type, rationale for integration, how and at what stage integration occurred, whether a joint display was used, and whether convergence or divergence between the quantitative and qualitative components was reported, alongside the authors' overall meta-inference. Any disagreements during extraction were resolved through discussion or referral to a third reviewer. Where required, authors of papers were contacted to request missing or additional data for clarification.

Data synthesis and integration

In line with JBI methodology for mixed methods systematic reviews, this review followed a convergent segregated approach to synthesis and integration²⁰. Quantitative and qualitative evidence were analysed separately using distinct synthesis methodologies, with the resulting findings subsequently integrated to provide a comprehensive overall interpretation.

Quantitative synthesis

We planned to conduct meta-analysis where feasible. Where meta-analysis was not possible due to between-study heterogeneity, we planned to conduct quantitative synthesis in accordance with the synthesis without meta-analysis reporting guideline²¹, which provides a framework for transparent reporting when alternative synthesis methods are used.

Qualitative synthesis

We planned to follow the three-stage approach to thematic synthesis described by Thomas and Harden²⁵. Where this was not possible, we planned to present the findings narratively.

Integration of quantitative evidence and qualitative evidence

We planned to involve young people from often-ignored communities to support the integration of qualitative and quantitative evidence. The findings of each single method synthesis included in this review were planned to be configured according to the JBI methodology for mixed methods systematic reviews²⁶. This involves quantitative and qualitative evidence being juxtaposed and organised/linked into a line of argument to produce an overall configured analysis. Where configuration was not possible the findings were presented in narrative form.

Reflexivity

This review synthesises evidence from a range of secondary sources and was conducted by a multidisciplinary team with diverse cultural, ethnic, and socioeconomic backgrounds, as well as varied professional experience across mental health research, clinical practice, and community engagement. Young people from often-ignored communities were also involved in the interpretation of the findings. Their lived experiences and perspectives may have contributed to shaping the interpretation by foregrounding issues of relevance, accessibility, and acceptability for young people.

Public and patient involvement

This study is grounded in the principles of Public and Patient Involvement and Engagement, recognising the value of lived experience in shaping meaningful and relevant research. In line with this approach, we collaborated with young people from often-ignored communities who are part of the Youth Advisory Group at the Institute for Mental Health, University of Birmingham. Involvement was conducted through two online meetings. They provided input on the language used, helping to ensure that terminology was non-stigmatising and reflective of young people's experiences. They also contributed to the interpretation of the synthesised findings, offering perspectives that helped to foreground issues of relevance, accessibility, and acceptability for young people from often ignored communities. This ensured that the review findings reflect the needs, perspectives, and priorities of young people from often ignored communities, rather than being driven solely by academic or clinical interpretation of the evidence. This input informed how findings were integrated and presented in discussion section.

Results

Study characteristics

[Insert Fig. 1. Prisma Diagram]

Searches yielded 2,293 records, with 1,624 unique records for screening once duplicates were removed (Fig. 1). Following title and abstract screening, we reviewed 95 full-text articles. A total of 7 studies met the inclusion criteria, where 6 studies were quantitative and only one study was mixed methods. Among quantitative studies, we identified three randomised controlled trials (two cluster, one 2×2 factorial), and

three non-randomised control trials. The mixed methods study consisted of a non-randomised open trial and qualitative focus group discussions. Publication dates range from 2016 to 2025, with six out of seven included studies published in the last five years. The sample sizes ranged from 30 to 2598 retained participants. Two studies were conducted in Africa: one in Uganda, focusing on students from impoverished peri-urban districts²⁷, and one in South Africa, focusing on unemployed young men from low-income townships²⁸. Two studies were conducted in Israel, both targeting at-risk youth from lower socioeconomic backgrounds attending vocational schools^{29,30}. One study was conducted in Hong Kong, focusing on at-risk delinquent youth engaged with community outreach services³¹. One study was conducted in Australia, recruiting young people with mild-to-moderate depression and anxiety from Headspace community mental health centres in disadvantaged suburbs of Melbourne³². The only mixed methods study was conducted in Canada, targeting youth at risk of homelessness and those from immigrant or refugee backgrounds³³.

Across the seven included studies, physical activity components varied considerably and were not consistently or clearly reported. Only one study specified the physical activity component directly, identifying soccer as the primary activity²⁸. Wong et al. described adventure-based, experiential, and sports-related activities generally popular among youth, including dancing, track running, and boxing³¹. Vancampfort et al. reported adaptable activities based on teachers' and students' own backgrounds, including dance and drum playing, traditional games, and group walks²⁷. Vasudev et al. centred their physical activity component on yoga-based breathing and light body-conditioning activities designed to increase flexibility and strengthen the body, forming the core of the programme's Healthy Body module³³. All remaining studies reported tailoring their physical activity component to facilitators' competencies and participants' preferences and abilities, without specifying the activity type^{29,30,32}.

Similarly, mental health components varied considerably in their theoretical grounding and delivery format. These included cognitive-behavioural life skills programmes²⁸; structured psychoeducation sessions covering symptom recognition, stress management, and help-seeking²⁷; problem-solving therapy and supportive counselling delivered by trained clinicians³²; formal cognitive behavioural therapy (CBT) and mindfulness-based CBT alongside activity-based supportive counselling³¹; online mentoring conversations focused on emotional wellbeing, resilience, and goal-setting^{29,30}; and a multimodal curriculum addressing emotional regulation, social connectedness, and healthy decision-making³³.

This heterogeneity precluded statistical pooling, and a meta-analysis was not conducted. Quantitative findings are synthesised narratively below in accordance with the Synthesis Without Meta-analysis guideline²³, with studies grouped by outcome domain. Effect estimates are reported as provided by the original study authors. Quality ratings from Mixed Methods Appraisal Tool are noted throughout to contextualise the strength of the evidence. Full study characteristics are presented in Table 1.

[Insert Table 1 – study characteristics]

Grey literature and community-based initiatives

In addition to the formal database and grey literature search strategy outlined above, we scoped organisational websites, publicly available reports, and practice-facing events bringing together organisations working in physical activity and youth mental health, and drew on G.E. Hale's doctoral research examining mental health provision within football community settings^{34,35}. This scoping identified a range of community and public-sector initiatives – including those delivered by Football Club Community Trusts, the English Football League, and various grassroots and charitable organisations – that appeared to combine physical activity with some form of mental health support for young people. However, none of these initiatives had published outcome data, formal evaluation, or sufficient programme description to meet our eligibility criteria, and where any outcome reporting did exist, it typically concerned populations younger than 16 or older than 25 years. As this scoping activity did not yield records suitable for formal screening or data extraction, it is not reflected in the PRISMA flow diagram (Fig. 1); we report it here for transparency and return to its implications in the Discussion.

Quality assessment

Initial agreement between the two reviewers was 69.5%, and the kappa coefficient ($\kappa = 0.37$), which reached 100% agreement upon discussion. Of the included studies, methodological quality was generally low, with six of the seven appraised studies rated as high risk of bias (Table 2). The most prevalent limitations were a lack of confounder control, non-representative sampling, and poor adherence or fidelity monitoring. Across the non-randomised studies^{29,30,31,33}, none adequately accounted for confounders in either design or analysis, and all relied on convenience samples selected through non-probability methods. Whereas among the randomised controlled trials^{27,28,32}, recurring concern was non-comparability and imbalances between baseline samples. Additionally, intervention adherence was either not reported or lower than 70%. Only one study was rated low overall risk of bias³².

The single mixed-methods study was rated high risk of bias based on the overall rating of individual scales (qualitative and quantitative)³³. Its qualitative component was rated low risk of bias, with rigorous data collection, systematic thematic analysis, and a clear audit trail from data to interpretation. However, its quantitative strand was rated high risk of bias due to high attrition (39%), absence of a control group, and documented mid-study protocol deviations.

[Insert Table 2 – Quality Assessment]

Quantitative synthesis

One of the aims of this review was to examine the effectiveness of integrated physical activity and mental health interventions in improving physical and mental health outcomes. All studies used self-report measures. The most assessed outcome of our interest was depressive symptoms, followed by anxiety, psychological distress, life satisfaction and social support. No studies looked at physical health outcomes. Three looked at physical activity, with two assessing frequency of engagement and duration, and one through satisfaction with leisure activities.

[Insert Table 3 – Psychological Quantitative Results]

Depression and anxiety

Depression and anxiety were the most consistently assessed outcomes, reported in three and two studies respectively, across three measurement instruments for depression (PHQ-9-A, BDI-II/MADRS, CES-D) and two for anxiety (GAD-7, BAI).

Depression

Evidence on depression outcomes across these three RCTs is mixed. Rabie et al. (South Africa; $n = 1,193$) found no significant effect on depressed mood ($OR = 0.93$, $p = 0.68$)²⁸. By contrast, Vancampfort et al. (Uganda; $n = 2,598$) found a significant group $\times$ time interaction ($d = 0.44$, $p < .001$), with intervention participants' PHQ-9-A scores declining from a mean of 8.4 to 6.2 in the intervention group, while controls remained essentially unchanged (7.4 to 7.5)²⁷. Parker et al. (Australia; $n = 176$) found that all arms improved over time, but behavioural activation physical activity intervention produced a small-to-moderate advantage over lifestyle psychoeducation on both self-report (BDI-II: $d = 0.41$) and observer-rated (MADRS: $d = 0.48$) measures³². Overall, two of three trials support a beneficial effect of integrated physical activity and mental health intervention on depression, while one large cluster RCT found none.

Anxiety

As with the depression outcomes, evidence for anxiety was inconsistent across studies. Vancampfort et al. reported a significant group $\times$ time interaction on the GAD-7 ($d = 0.50$), with intervention students' scores declining from the mild anxiety range (mean 7.5) to below threshold (mean 5.4) at follow-up, while controls showed no meaningful change (6.4 to 6.2)²⁷. The overall group effect was not significant ($F = 0.9$, $p = 0.35$). In contrast, Parker et al. found no significant between-group difference on the BAI ($F = 0.88$, $p = .417$), despite a large overall time effect indicating substantial anxiety reduction across all arms ($F = 109.43$, $p < .001$)³².

Psychological distress, resilience, and wellbeing

Five studies examined broader psychological outcomes using the GHQ-12³¹, BSI and BRS²⁹, CSI³³, PSS-10²⁸, and the HBSC psychosomatic symptom checklist and Cantril Ladder³⁰. Of the four studies assessing broader psychological outcomes, three were rated at high risk of bias.

On psychological distress specifically, findings were mixed. Glaser et al. ($n = 56$) reported a large within-group improvement in psychological distress (BSI: $d = -1.03$, $p = .02$), though groups were not equivalent at baseline and the between-group post-test differences were not significant ($t = -1.45$, $p = .15$)²⁹. Wong et al. ($n = 115$) found a significant within-arm reduction in GHQ-12 distress for CBT ($d = -0.44$), a smaller non-significant reduction for activity-based supportive counselling ($d = -0.32$), and a slight increase for mindfulness-based CBT ($d = 0.19$)³¹. Rabie et al. found non-significant stress reduction ($OR 0.89$)²⁸, and Vasudev et al. ($n = 30$) found only a non-significant downward trend in CSI mental health symptoms over eight weeks ($F = 1.08$, $p = .357$)³³.

For other psychological outcomes, Glaser et al. found a large within-group improvement in resilience on the BRS ($d = 1.88$), with intervention students moving from the "low" to "normal" range, though again the between-group post-test difference was not significant ($t = -0.69$, $p = .49$)²⁹; and Glaser et al. ($n = 180$) found significant between-group differences in both psychosomatic symptoms ($t = -12.94$, $p < .001$, $d = 1.68$) and life satisfaction ($t = -8.51$, $p < .001$, $d = 0.68$)³⁰.

Physical activity

Three studies measured physical activity as a primary or secondary outcome using the HBSC single item³⁰, the Active Australia Survey³², and the Q-LES-Q-18 leisure subscale³¹.

Across the three studies assessing physical activity, findings were mixed. Glaser et al. found a statistically significant between-group difference in the proportion of participants meeting the physical activity threshold (≥ 4 active days per week), with the intervention group increasing from 0.97% to 58.25% while the control group showed no change ($\chi^2 = 60.17$, $p < .001$)³⁰. By contrast, Parker et al. found that although physical activity frequency increased across all arms (0.73 to 1.47 days/week), neither the physical activity nor psychological intervention produced a significantly greater increase than its respective comparator (both $p > .19$)³², and Wong et al. found a significant improvement in leisure activity satisfaction for activity-based supportive counselling relative to mindfulness based cognitive therapy ($F = 3.15$, $p < .05$), while CBT showed negligible change ($d = 0.08$) and mindfulness-based CBT declined ($d = -0.22$)³¹.

[Insert Table 4 – Physical activity and social quantitative results]

Social, community and behavioural outcomes

Five studies measured additional social and behavioural outcomes. Four of these looked at substance use^{28,30,32,33}, one at delinquency behaviours³¹, one at the community integration³³, and one at the social and occupational functioning³². Across the four studies that assessed substance use, findings were mixed. Rabie et al. found no significant effects on alcohol or substance use (Ors = 0.95–1.08, all not significant)²⁸, and Vasudev et al. found no significant change in substance use problems ($F = 0.43$, $p = .601$)³³, whereas Glaser et al. found a significant reduction in smoking ($\chi^2 = 27.05$, $p < .001$) but no effect on binge drinking or cannabis use³⁰. Parker et al. also found a significant reduction on the substance and choices scale ($z = 2.52$, $p = .012$)³².

Additionally, Rabie et al. found no significant effects on sexual health risk behaviour, violence, or community engagement (ORs 0.69–1.50 and not significant)²⁸. For the remaining outcomes, Parker et al. found a non-significant trend towards better social and occupational functioning in the physical activity group ($F = 3.12$, $p = .080$)³², and Vasudev et al. found no significant changes in community integration, either psychologically or across physical integration activities³³.

Qualitative synthesis

This review also aimed to understand experiences and perspectives of often ignored young people engaging with integrated physical activity and mental health interventions. No stand-alone qualitative studies were identified that addressed this review question. A single qualitative strand was available, derived from the mixed-methods feasibility study by Vasudev et al.³³. Given the limited number of studies, thematic synthesis was not feasible, and qualitative findings are presented narratively.

Vasudev et al. employed focus groups and individual interviews with young people at-risk of homelessness and from immigrant and refugee backgrounds (n = 30, aged 16–25) in Canada³³. Data were analysed using reflexive thematic analysis³⁵, generating nine themes and 42 sub-themes. The key themes relevant to this review are outlined below.

Participants generally described the programme positively, characterising it as a relaxed, non-clinical, non-judgmental space, distinct from formal health or educational settings, that supported emotional regulation and provided welcome structure amid unstable housing or immigration circumstances. Social connection stood out as the most consistently valued aspect, with group participation fostering a sense of belonging and reducing isolation. Participants valued an optimal level of familiarity within their group, and the presence of both male and female facilitators who were supportive and accessible. This increased their levels of comfort without overshadowing the programme's purpose.

Participants also identified logistical coordination and communication issues as significant barriers to consistent attendance and offered practical suggestions for addressing issues. The issues mentioned included scheduling, transport, availability of the childcare support, communication about the programme, and the physical environment. To address these, participants suggested timely session starts, more frequent and consistent scheduling, and clearer structure around expectations and discipline within sessions. A central, accessible delivery location was also recommended, alongside adaptations to the sensory environment, such as introducing calming sounds, avoiding strong or unpleasant smells, and adjusting room temperature.

Notably, the degree of benefit participants reported was not uniform. It appeared to depend on individual circumstances, prior experience with the techniques, and how much participants were able to sustain engagement over time, rather than being an inherent effect of the programme itself. As this evidence is drawn from a single study, these findings should be interpreted as indicative rather than generalisable.

Integration of quantitative and qualitative evidence

Given the substantial quantitative heterogeneity and the single qualitative source, a full and systematic configuration of all findings into a unified line of argument was not possible. Instead, the two streams were considered together to identify points of meaningful overlap or contrast. These observations are partial and exploratory rather than a comprehensive integrated account and should be interpreted as illustrative rather than confirmatory.

Tailoring interventions to individual needs and circumstances

One area of convergence concerned the importance of tailoring interventions to participants' preferences, needs, and circumstances. Vasudev et al. suggested that intervention suitability varies according to participants' prior experience, readiness to engage, and broader life circumstances³³. Five of the six quantitative studies offered some form of tailoring: Vancampfort et al. adapted activities to teachers' and students' own backgrounds²⁷; Parker et al. and both Glaser et al. studies tailored delivery to facilitator competencies and participant preference^{29,30,32}; and Wong et al. offered three distinct therapeutic approaches varying in activity intensity³¹. Notably, only CBT produced a significant within-group reduction in psychological distress ($d = -0.44$, $p < .05$), while activity-based supportive counselling did not reach significance ($d = -0.32$) but significantly outperformed mindfulness-based CBT on quality of life and leisure activity outcomes ($F = 6.39$ and $F = 5.92$, both $p < .05$). While activity-based supportive counselling did not show significant within-group reduction in psychological distress, it significantly outperformed mindfulness-based CBT on this outcome at trend level ($F = 3.60$, $p < .10$). activity-based supportive counselling also significantly outperformed mindfulness-based CBT on quality of life and leisure activity outcomes ($F = 6.39$ and $F = 5.92$, both $p < .05$). This raises the possibility that mindfulness-based CBT's stillness-based approach was a poorer match for this at-risk, potentially more restless population than the higher-energy alternatives, offering a plausible, population-specific extension of the broader tailoring principle identified qualitatively.

By contrast, the only study using a single fixed activity with no scope for adaptation, Rabie et al., found null effects across all outcomes despite the largest sample size²⁸. The authors themselves noted the structural hardships faced by this population and suggested football may be better positioned as an early engagement strategy than a stand-alone treatment.

Engagement and adherence as contributors to intervention effectiveness

Sustained engagement emerged as a second area of convergence. Participants in Vasudev et al. described engagement as being influenced by personal commitments, prior experiences with intervention activities, levels of trust, comfort within group settings, and willingness to actively participate³³. This pattern was broadly mirrored quantitatively: Glaser et al.^{29,30}, with full attendance, reported some of the strongest improvements across outcomes; Parker et al., with 60.2% session completion, found small-to-moderate depression improvements³²; Wong et al., with 38.5% and 23.1% attrition across arms, found mixed effects³¹; and Rabie et al., with the lowest attendance (45.5%), found no significant effects on any outcome²⁸. Although adherence data were not consistently reported across all studies, the available evidence suggests that sustained engagement may be associated with more favourable outcomes.

Barriers to Sustained Engagement

Across both evidence streams, poor sustained engagement emerged as a pervasive barrier. Quantitatively, the one study with the largest sample produced entirely null findings despite adequate power, most plausibly explained by only 45.5% weekly attendance²⁸. Qualitatively, Vasudev et al. identified concrete logistical and structural barriers underlying poor attendance³³. These include transportation, inconvenient session timing, lack of childcare support, inconsistent scheduling, and the housing instability and competing life demands many participants were navigating outside the programme. Participants' own suggestions for improvement, including more frequent and consistently scheduled sessions and a more accessible delivery location, reinforce the quantitative pattern of attrition being linked to logistical and structural factors rather than disengagement from the underlying content. This offers a plausible account for why adherence varied so substantially across the quantitative studies above: poor engagement may reflect barriers in implementation and context rather than the intervention lacking value to participants.

Social connection and supportive environments as potential mechanisms of benefit

Social connection and supportive environments emerged as one of the strongest areas of convergence between the two evidence streams. Participants in Vasudev et al. identified routine, supportive peer and facilitator relationships, and feelings of safety and belonging as central to their experience³³.

Quantitatively, Glaser et al. reported significant within-group improvement in perceived social support ($d = 1.22$)⁹⁸, and Parker et al. found significant depression benefits in the context of consistent therapeutic contact³²; Glaser et al. noted that "a caring adult act[s] as a protective factor against a range of risky behaviours"²⁹. Vancampfort et al. similarly described a psychologically safe, peer-led delivery environment²⁷. Together, this suggests the relational and contextual qualities of an intervention — a non-judgemental space, supportive facilitators, absence of performance pressure — may matter as much as its physical activity content.

Gaps between the two evidence streams

Despite these areas of convergence, important gaps remained between the quantitative and qualitative evidence. Several outcomes assessed quantitatively, including substance use, violence, HIV-related risk behaviours, delinquency, and community engagement^{28,31}, were not explored within the qualitative study. Conversely, several themes that emerged strongly within the qualitative findings were rarely assessed quantitatively. These included social belonging, trust, programme acceptability, perceptions of safety, routine, structure, accessibility, communication, and environmental characteristics of programme delivery. While participants consistently identified these factors as important to their experiences and engagement, they were largely absent from quantitative evaluation. As a result, several potentially important mechanisms through which integrated interventions may influence outcomes remain insufficiently understood.

Discussion

This mixed methods review synthesised quantitative and qualitative research examining integrated physical activity and mental health interventions implemented for often-ignored youth, their effectiveness, young people's experiences of engaging with them, and the barriers and enablers affecting implementation.

A promising but largely invisible evidence base

The evidence base for integrated physical activity and mental health interventions in often ignored young people remains inconclusive. This review found little to no high-quality published evidence within our target population. Across seven databases and 1,624 screened records, only seven studies met inclusion criteria, spanning six countries (South Africa, Uganda, Israel, Australia, Hong Kong, and Canada) and approximately 4,700 participants. Notably, the majority of integrated interventions encountered during scoping and screening targeted children under 16 or adults over 25, leaving our specific age range comparatively underserved by the existing literature. Of the seven included studies, none provided a clear protocol or detailed description of their physical activity component. Only Rabie et al. specified a named activity (football)²⁸; all other studies reported tailoring their physical activity content to facilitators' competencies and participants' preferences and abilities, including dance, drumming, traditional games, yoga-based breathing, and adventure-based sport. While this individually tailored approach is consistent with what we consider good practice, the absence of any description of what this tailoring actually involved means none of these interventions could be replicated based on the published record alone.

Beyond the formally published literature, our scoping work identified substantial community and public-sector activity in this space that remains largely invisible to standard systematic review methodology. This is not necessarily because such evidence does not exist, but because it lacks the publication infrastructure, evaluation capacity, or incentive structures through which it would typically enter the academic record. This points to a meaningful evidence-practice gap. A substantial body of real-world innovation and lived practice, much of it directly relevant to our review questions, currently remains undocumented and is therefore unable to inform either future research or commissioning decisions in this space. It also raises a methodological question for future reviews in this and adjacent fields. Standard database searching alone may be insufficient to capture the landscape of practice for often ignored or emerging populations, meaning stakeholder engagement, conference attendance, and direct outreach to practitioners, as undertaken in this review, may need to become a more standard component of systematic review methodology in this area. The age pattern observed in both the published and grey literature may itself be explained by this gap, since the 16 to 25 age range sits awkwardly between child focused and adult focused service structures, and may be similarly underserved by the infrastructure that would otherwise generate and report evidence for either group. Relatedly, while qualitative research is clearly lacking in the published literature we identified, this same evidence-practice gap suggests that qualitative or experiential insight may exist informally within community and practice settings without ever being written up for academic dissemination, meaning the absence of published qualitative evidence may reflect a gap in publication rather than a true absence of relevant lived experience.

Nonetheless, the majority of included articles were published within the last five years, alongside a noticeable rise in community initiatives over the same period. This suggests integrated interventions represent a growing area of both research and practice, consistent with a broader shift away from treating mind and body as separate domains and toward mental health policy that embraces more holistic models of care^{37,38}.

Symptom relief without behaviour change

Despite the limited evidence base, our review included studies reporting integrated interventions showing positive effects on mental health symptoms, particularly depression and anxiety. Vancampfort et al. reported moderate improvements in both depression and anxiety in a large school-based cluster RCT²⁷, and Parker et al., found a small-to-moderate advantage of physical activity over psychoeducation for depression, replicated across two independent measures³². However, these patterns of improvement in depression and anxiety are not unique to integrated interventions and are similarly reported in physical-activity-only³⁹ and mental-health-only intervention literature for depression⁴⁰ and anxiety⁴¹. No study in this review directly compared an integrated physical activity and mental health intervention against a physical-activity-only or mental-health-only comparator, which means we cannot determine whether combining the two adds value beyond either component alone. Notably, this comparison has begun to be addressed in adult populations. A recent meta-analysis of 20 RCTs found aerobic exercise combined with standardised treatment produced a significant moderate benefit over standardised treatment alone for depression (SMD = - 0.72)⁴², but no equivalent comparison exists for young people nor for often ignored young people. The closest available evidence is Wong et al., which compared activity-based supportive counselling against CBT and mindfulness-based CBT³¹. Activity-based supportive counselling outperformed mindfulness-based CBT on psychological distress at trend level and significantly on quality of life and leisure activity outcomes, but it did not outperform CBT on any outcome. Whereas only CBT showed a significant within-group reduction in psychological distress. This suggests that an integrated activity-based approach matched but did not exceed the benefit of a mental-health-only intervention. The given advantage was driven by mindfulness-based CBT performing poorly, rather than activity-based supportive counselling performing exceptionally well. It therefore remains unclear where integrated interventions stand relative to single-component alternatives.

A further consistent pattern was that effectiveness was concentrated in symptom-level outcomes rather than behaviour change. No study demonstrated a sustained effect on reduced substance use, risk behaviour, or increased physical activity participation itself. The biggest contributor to this pattern across the review appears to be adherence, with attrition and non-completion in most included studies ranging from approximately 38% to 55%. These reports are consistent with the broader literature on physical activity interventions in mental health populations, where dropout rates of around 18% have been reported in depression⁴³ and comparable patterns in anxiety⁴⁴, as well as with the 13% of dropout rates within obese children⁴⁵. Notably, attrition in the present review exceeded even these benchmarks, suggesting

that the additional structural barriers facing often ignored populations may compound an already well-documented adherence challenge.

One size does not fit all: individual and contextual influences on engagement

Qualitative evidence in this review was limited to a single source³³, which found that participants' experiences were mixed and depended on personal commitments, prior experience with the activities offered, levels of trust, comfort within group settings, and willingness to actively participate. This is not only consistent with discussion points presented in two included quantitative studies^{28,30}, but also with the other established psychological theories. For example, Bandura's self-efficacy theory suggests that activities perceived as achievable but appropriately challenging tend to support engagement, whereas activities perceived as beyond a person's ability may provoke anxiety rather than alleviate it⁴⁶. This may present a challenge toward designing group-based interventions delivered at scale. Tailoring to the degree of individual nuance is difficult in a group format, and some participants within any given group are likely to be offered activities that do not suit them, which reinforces the need to think carefully about how, when, and for whom the intervention is designed, rather than assuming a single intervention model can suit a heterogeneous population of often ignored young people.

Apart from the individual variability, the barriers identified in this review were broadly consistent with prior physical-activity-only research in often ignored communities. For example, in PA research, community and environmental factors have influence on engagement, specifically having spaces that are safe from harm, temperature-controlled, conveniently located near participants' homes or workplaces, and affordable or free to access^{17,47,48}. These are the very same factors participants in Vasudev et al.'s study identified³³, though they additionally emphasised the importance of transparency in communication and a supportive group dynamic. Together, these findings suggest that the relational and contextual qualities of an intervention may matter as much as its physical activity content, a possibility formalised within realist approaches to complex intervention evaluation, where the key question is not whether an intervention works, but what works, for whom, and why⁴⁹. This has been demonstrated in physical-activity-only interventions, where outcomes depend on the interaction between programme mechanisms and context rather than activity content alone⁵⁰, and echoes calls for whole systems thinking and co-production with people with lived experience as alternatives to traditional effectiveness trials⁵¹. This would mean continuing to tailor interventions to participants' needs but doing so in active collaboration with the communities being targeted.

Strengths and Limitations

This is the first systematic review to combine physical activity and mental health interventions for often ignored young people. An addition to already rigorous systematic review process is that this review included independent dual review at every stage (screening, data extraction, and quality appraisal) with disagreements resolved through structured discussion. Also, this is one of few systematic reviews that involved young people with lived experience in the interpretation of findings that directly shaped several of the interpretive inferences presented in this discussion. Nevertheless, we also note several limitations.

Firstly, this review is limited by a small number of heterogeneous studies, which did not allow us to use meta-analysis, nor to generalise our findings. The substantial heterogeneity was present not only between studies but within the very terminology used to define the scope of this review. "Mental health" and "physical activity" are broad umbrella terms encompassing many distinct constructs, components, and measurement approaches, and this variability limited the comparability of included interventions and outcomes.

Similarly, "often ignored communities" is a broad umbrella term encompassing diverse populations, and the studies included in this review referred to different target populations within this broader category. Secondly, while most included studies reported tailoring their physical activity component to participants' needs and preferences, none provided a clear protocol or description of what this tailoring involved in practice. This represents a significant limitation in the underlying evidence base itself.

Thirdly, the small number of studies particularly affected the qualitative synthesis, which relied on a single source and could not be meaningfully compared or triangulated against other quantitative accounts.

Recommendations

Future research should build on the current trajectory toward individually tailored, holistic interventions, but pair this with substantially higher-quality reporting, including structured, transparent protocols for both the physical activity and mental health components, to enable replication and meaningful synthesis in future reviews. There is also a clear need for more, higher-quality qualitative and quantitative research in this area, co-designed with often ignored young people from the outset rather than consulted only retrospectively. Future quantitative trials would benefit from realist or hybrid effectiveness-implementation designs capable of capturing not only whether an intervention works, but for whom and under what conditions, alongside the development of core outcome sets to reduce measurement heterogeneity and support future evidence synthesis. Future trials should also directly compare integrated physical activity and mental health interventions against physical activity-only and mental health-only comparators, which would allow the field to determine whether integration offers genuine added value rather than simply replicating effects achievable through either component alone. Longer follow-up periods are also needed to assess whether engagement and effects are sustained beyond the immediate intervention period. On the other hand, qualitative research in this area is close to non-existent and urgently needed. Further studies are needed not only to explore the attitudes, preferences, barriers, and facilitators experienced by young people themselves, but also from the perspective of the organisations delivering these programmes – what they implemented, whether they considered it successful, and how they experienced the process.

Conclusion

Despite a clear and growing demand for physical activity and mental health support delivered to often ignored young people in safe, non-institutional environments, this review found that almost no intervention meeting our inclusion criteria has been rigorously evaluated and published. The evidence that does exist,

however, reflects good intentions and is generally informed by participants' individual needs, but is undermined by poor methodological quality across nearly all included studies. There are promising findings that integrating physical activity and mental health support may benefit mental health outcomes specifically, and this may be better positioned as a preventative strategy rather than a treatment for conditions that are already established and entrenched. The meaningful progress in this field will depend on closing both the methodological and the evidence-practice gaps identified here.

Declarations

Conflicts of interest

B.I.P. is Topic Advisor for the National Institute for Health and Care Excellence for Severe and Enduring Mental Illness. B.I.P. is a Governance Board Member for the Medicines and Healthcare products Regulatory Agency (MHRA) Digital Mental Health Technologies AI Airlock. All other authors declare no financial or non-financial competing interests.

Author Contributions (CRediT)

M.A., S.L.G. and B.I.P. conceptualised the review. M.A., S.L.G. and B.P. developed the methodology. M.A., H.C., S.G.L., and B.V.M. conducted the investigation (screening, extraction, appraisal), with M.A. and S.G.L. responsible for formal analysis. M.A. wrote the original draft, and all authors contributed to review and editing. S.L.G. and B.I.P. supervised the project. M.A. acquired funding.

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Registration and protocol

This review has been registered on PROSPERO, CRD420251105259.

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Tables

Tables 1 to 4 are available in the supplementary files section.

Figures

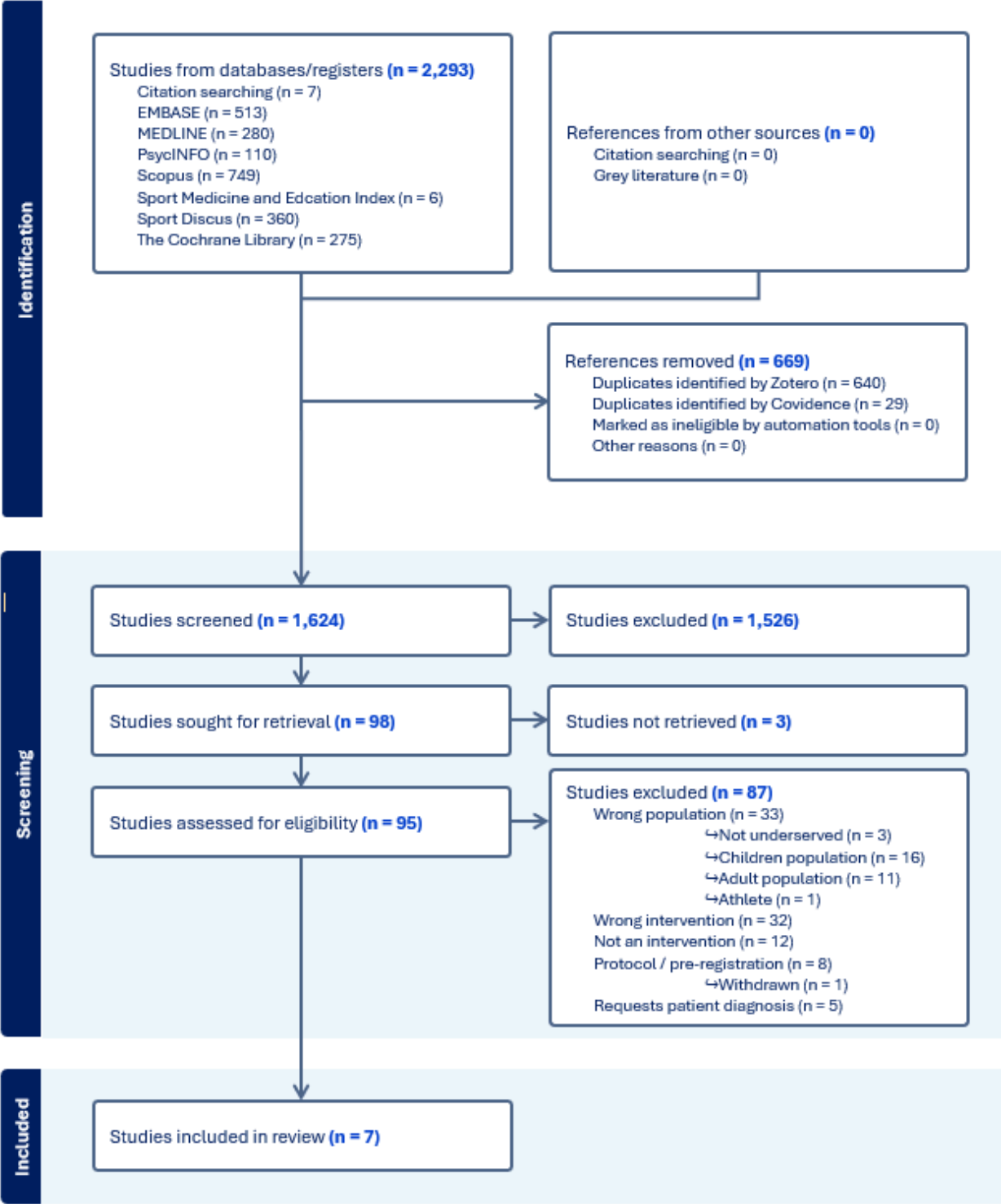


Figure 1

PRISMA flow diagram of the study selection process

Supplementary Files

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