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Active Musical Interventions in ADHD: Implications for Piano Practice – A Scoping Review

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ADMINISTRATIVE INFORMATION

Support - This review received no external funding.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 March 2026 and was last updated on 18 March 2026.

INTRODUCTION

Review question / Objective The objective of this scoping review is to map and synthesise the existing evidence on active musical interventions in individuals with Attention Deficit Hyperactivity Disorder (ADHD), with particular attention to instrumental music training and its potential implications for piano practice.

Using the PICOS framework:

Population: children and adolescents diagnosed with ADHD;

Intervention: active music-based interventions (e.g., music therapy, rhythm training, singing, music and movement activities, instrumental engagement);

Comparator: any comparator or no comparator;

Outcomes: attention, executive functions, behavioral regulation, and related cognitive or neurophysiological outcomes;

Study design: primary empirical studies of any design, including experimental, quasi-experimental, and pre-post intervention studies.

Review questions:

- What types of active musical interventions have been studied in individuals with ADHD?
- What cognitive, behavioural, or attentional outcomes are associated with active musical engagement in individuals with ADHD?
- What evidence exists regarding the potential role of piano practice and active musical interventions in supporting cognitive, attentional, or behavioural functioning in individuals with ADHD?

Rationale Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental condition associated with impairments in attention, executive functioning, and self-regulation. In recent years, increasing interest has emerged in non-pharmacological interventions that may support cognitive and behavioural functioning in individuals with ADHD. Active musical interventions, including instrumental training and structured music-making activities, have been suggested to enhance attentional control, executive functions, and emotional regulation. However, the existing evidence on the use of active musical engagement, particularly instrumental practice

such as piano training, remains scattered across different disciplines including psychology, music therapy, and music education.

This scoping review aims to map and synthesise the existing literature on active musical interventions in individuals with ADHD and to explore their potential implications for piano practice and music-based educational approaches. The review will help identify current evidence, research gaps, and directions for future interdisciplinary studies.

Condition being studied The condition of interest in this review is attention-deficit/hyperactivity disorder (ADHD), a common neurodevelopmental disorder with onset in childhood. ADHD is characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with functioning or development.

Children and adolescents with ADHD often present impairments in attention regulation, executive functioning, working memory, and behavioral self-regulation. These difficulties can negatively affect academic performance, social interactions, and daily functioning. In addition to core symptoms, many individuals with ADHD may also experience associated difficulties such as emotional dysregulation, motor coordination challenges, and reduced capacity for sustained cognitive engagement.

METHODS

Search strategy A comprehensive search strategy will be developed to identify relevant studies on active music-based interventions in children and adolescents with attention-deficit/hyperactivity disorder (ADHD).

Electronic database searches will be conducted in major scientific databases, including PubMed (MEDLINE), PsycINFO, and Scopus, or other, in order to ensure broad coverage of the literature across medical, psychological, and interdisciplinary fields.

The search strategy will combine terms related to ADHD and music-based interventions using Boolean operators (AND, OR). Key search terms will include: “ADHD” OR “attention deficit hyperactivity disorder” AND “music” OR “music therapy” OR “music training” OR “rhythm” OR “music intervention”. Additional terms such as “child*” OR “adolescent*” will be applied to focus on the target population.

Search limits will include studies published from 1980 onwards and those available in English. The reference lists of included studies will also be screened to identify additional relevant articles.

Participant or population The population of interest for this review will include children and adolescents diagnosed with attention-deficit/hyperactivity disorder (ADHD), aged under 18 years.

Studies involving participants with a formal diagnosis of ADHD based on established diagnostic criteria (e.g., DSM V) will be considered. No restrictions will be placed on the severity or subtype of ADHD (e.g., inattentive, hyperactive-impulsive, or combined presentation). Both clinical and community-based samples will be eligible for inclusion.

Intervention The intervention of interest includes active music-based interventions involving direct engagement in music-making activities. These may include, but are not limited to, music therapy approaches (e.g., structured musical activities), rhythm-based training, instrumental practice (such as piano or other instruments), and music and movement interventions.

Active music interventions are defined as those requiring participants’ active participation in producing, performing, or interacting with music, rather than passive listening only. Interventions may be delivered individually or in group settings and may take place in clinical, educational, or community contexts.

Studies combining music-based interventions with other therapeutic approaches (e.g., cognitive-behavioral therapy) will also be considered, provided that the music component represents a central element of the intervention.

Interventions based solely on passive music listening or background music exposure will be excluded unless they are part of a broader active music-based program.

Comparator As this is a scoping review, no specific comparator will be required for study inclusion.

Study designs to be included This scoping review will include experimental and quasi-experimental study designs, as well as other primary empirical studies (e.g., randomized controlled trials, non-randomized studies, pre-post studies, and pilot studies) that investigate active music-based interventions in individuals with ADHD.

Eligibility criteria Studies will be included if they are published in peer-reviewed journals and available in full text. Only articles published in English will be considered.

Studies focusing on active music-based interventions in individuals with ADHD will be

included, regardless of setting (clinical, educational, or community).

The following will be excluded: conference abstracts, editorials, commentaries, case reports, theoretical papers, reviews (systematic or narrative), and studies not reporting primary empirical data. Studies focusing exclusively on passive music listening without active engagement will also be excluded.

Studies involving adult populations (over 18 years) will be excluded, unless data for participants under 18 years can be clearly extracted separately.

Information sources The primary sources of information will include electronic bibliographic databases, namely PubMed (MEDLINE), PsycINFO, and Scopus, selected to ensure comprehensive coverage of medical, psychological, and interdisciplinary research.

In addition to database searching, the reference lists of included studies will be screened to identify further relevant articles. Where necessary, additional sources such as Google Scholar may be used to identify supplementary literature.

No direct contact with study authors or trial registries is currently planned.

Main outcome(s) The main outcomes of this review will focus on the cognitive, behavioral, and functional effects associated with active music-based interventions in children and adolescents with ADHD.

Primary outcomes will include measures of attention, executive functions (e.g., inhibitory control, working memory, cognitive flexibility), and behavioral symptoms related to ADHD (e.g., inattention, hyperactivity, impulsivity). Where reported, standardized assessment tools, behavioral scales, and neuropsychological measures will be considered.

Additionally, the types of music-based interventions used and their associated outcomes will be examined, with particular attention to the effectiveness of active engagement approaches (e.g., rhythmic training, music therapy, instrumental practice, including piano), in order to identify the most promising strategies for supporting cognitive and behavioral functioning in ADHD.

Additional outcome(s) Additional outcomes may include emotional regulation, social functioning, quality of life, and neurophysiological indicators (e.g., EEG or other biomarkers), where reported. Furthermore, aspects related to the implementation of the interventions, such as feasibility, acceptability, participant engagement, and intervention characteristics (e.g., duration,

frequency, type of musical activity), will also be considered.

Data management All identified records will be managed using a reference management tool (e.g., Mendeley or Zotero) to facilitate the organization and removal of duplicates.

Following the search process, titles and abstracts will be screened for relevance based on the predefined inclusion criteria. Full-text articles of potentially eligible studies will then be retrieved and assessed for final inclusion.

Relevant data from included studies will be systematically extracted and organized in a structured data charting form (e.g., Microsoft Excel), including key information such as study characteristics, participant details, type of intervention, and reported outcomes.

Quality assessment / Risk of bias analysis As this study is designed as a scoping review, a formal assessment of methodological quality or risk of bias of the included studies will not be conducted.

The aim of this review is to map the existing evidence and provide an overview of the available literature on active music-based interventions in ADHD, rather than to evaluate the effectiveness of interventions or generate practice recommendations.

However, key methodological characteristics of the included studies will be described narratively to provide context for the interpretation of findings.

Strategy of data synthesis The data will be synthesized using a descriptive and narrative approach. Extracted data will be presented in tables summarizing study characteristics and outcomes, and a narrative synthesis will be conducted to identify patterns across studies.

Findings will be grouped according to the type of music-based intervention and the outcomes assessed, allowing for a comprehensive overview of the existing evidence.

Subgroup analysis As this is a scoping review, no formal subgroup analysis will be conducted. However, where relevant, findings may be presented according to key characteristics such as type of intervention, age group, and outcome domains.

Sensitivity analysis As this is a scoping review, no sensitivity analysis will be conducted.

Language restriction Only studies published in English will be included.

Country(ies) involved Romania.

Keywords Attention deficit hyperactivity disorder; Piano; Music intervention.

Contributions of each author

Author 1 - Tatiana Dănciulescu - Author 1 conceived the study and developed the review protocol, and will conduct the literature search, screening, data extraction, and drafting of the manuscript.

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