Mapping Movement Integration in Secondary Schools: A Scoping Review of Evidence, Practices, and Implications

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Background and Purpose of Proposed Study

Physical activity (PA) is pivotal for children and adolescents, offering numerous physical, mental, social, and emotional benefits (Poitras et al., 2016). Furthermore, PA has a direct correlation with enhanced school performance among students (Santana et al., 2017). However, a concerning observation indicates that a significant portion of school-aged youth in the United States falls short of adhering to the national PA guidelines (Piercy et al., 2018). These guidelines emphasize that children, within the age bracket of 5-17, should engage in a minimum of 60 minutes of PA daily.

During the critical transitional phase into adolescence, there is a marked decline in children's involvement in PA (Hallal et al., 2012). This decline underscores the importance of this developmental stage, presenting it as a critical point of intervention. Schools, owing to their vast reach and the significant hours children spend there, are uniquely positioned to bridge this PA gap (Institute of Medicine, 2013). Current recommendations suggest that children should receive at least half (30 minutes) of their daily PA dosage during school hours. Yet, existing school PA programming, encompassing physical education lessons and recess, often falls short due to scheduling constraints. Consequently, many students lack sufficient opportunities to achieve the recommended 30 minutes of daily in-school PA (World Health Organization, 2020).

An emerging solution to this challenge is Movement Integration (MI), which represents an innovative approach where PA is seamlessly woven into the conventional classroom schedule (Webster et al., 2015). This could manifest in various ways, from integrating PA into academic lessons to simply introducing PA breaks interspersed between lessons. While MI has shown promise, especially in increasing students' PA levels, much of the existing evidence, conceptual foundations, and guidelines predominantly revolve around elementary school settings (Moon & Webster, 2019). Although there is a growing emphasis on developing an evidence base for secondary schools that reflects the distinct contexts of middle and high schools (Fenesi et al., 2022), a noticeable gap remains in research regarding MI applications and best practices/recommendations specifically tailored for secondary schools.

The crux of this proposed study emerges from the evident gap in understanding how MI can be effectively instituted within secondary level school environments. Given the established benefits of PA and the challenges faced in meeting the set guidelines, it becomes imperative to explore alternative strategies. MI stands out as a promising solution, but its implementation and efficacy in secondary settings remains understudied. A scoping review is ideal for topics that have not been extensively reviewed or when a field is rapidly evolving. Because of the lack of research concerning MI in secondary schools, it constitutes a viable topic for more substantial review, to canvas the scope of research, and explore new strategies or concerns. We believe that there is sufficient preliminary evidence to meet our inclusion criteria, given the rising interest in PA integration in educational settings. A preliminary search of MEDLINE, the Cochrane Database of Systematic Reviews, and Joanna Briggs Institute (JBI) Evidence Synthesis was conducted and no existing systematic reviews or scoping reviews on the topic were identified.

By undertaking this proposed study, our objective is twofold: to map the existing evidence on MI in secondary schools and to identify gaps in the knowledge base that warrant further investigation. The decision to employ scoping review methodology stems from our primary intention to map the breadth of evidence rather than assess its depth. Therefore, the purpose of this study will not only encapsulate the present understanding of MI in secondary schools but also guide future research directions, aiding in the development of evidence-based MI practices tailored for secondary level students. The research questions that will guide the study are as follows:

1. What are the substantive features of the MI studies included in the review, such as the population studied, countries (place of study) represented, and other publication information (e.g., conceptualization, theory-drive)?

2. What are the methodological features of the studies included in the review, encompassing the research designs, measurement approaches, and sample characteristics?
3. How are the characteristics of MI described in the included studies, specifically when evaluated against the MI Wheelhouse framework (Moon & Webster, 2019)?
    - What strategies do secondary teachers commonly employ when implementing MI in their instruction?
    - Which specific factors play pivotal roles in the implementation and success of MI in secondary educational settings?

Methods and Plan of Work

This proposed study will adhere to the methodology prescribed by the JBI for scoping reviews, as detailed in Peters et al. (2020). The JBI methodology, drawing upon foundational frameworks by Arksey and O'Malley (2005) and Lavac et al. (2010), provides a rigorous, structured approach to scoping reviews, facilitating comprehensive data sourcing, extraction, and synthesis. By applying this methodology, the study aims to ensure robustness and thoroughness in identifying relevant literature, assessing the quality of studies, and deriving meaningful insights. Furthermore, to enhance transparency and consistency in our reporting, the study will utilize the Preferred Reporting Items for Systematic review and Meta-Analyses extension for Scoping Review (PRISMA-ScR) Checklist as outlined by Tricco et al. (2018). This checklist ensures that the study is conducted and reported systematically, adhering to best practices and standards in the field.

Eligibility Criteria

Participants

This proposed study will consider previous studies that select students from an international demographic enrolled in secondary education. The emphasis is on students classified in the "middle school" or "junior high" domain, typically spanning grades 6-8 or years 7-9, subject to their nation's educational paradigm. Further, those within the "high school" or "senior high" segments, predominantly in grades 9-12 or years 10-12 respective to their nation's educational configuration, are incorporated. Predominantly, the criteria target individuals aged approximately 11-18, encompassing a broad spectrum of middle and high school attendees from varied international contexts, including preadolescents, young adolescents, and youth. In contrast, the exclusion criteria delineate that studies targeting students beyond the specified grades or years, those not deemed "typically developing" – notably with diagnosed physical or cognitive impairments like cerebral palsy or traumatic brain injuries – and works presented solely as abstracts, including theses and dissertations, fall outside this research's purview.

Concept

MI is the act of integrating PA, irrespective of its intensity level, into regular classroom periods during school (Moon & Webster, 2019; Webster et al., 2015). This concept encompasses terminologies such as active learning, active classroom, activity breaks, brain breaks, brain boosters, energizers, physically active lessons, and physical activity breaks. The potential efficacy of MI in addressing the decline of PA during secondary education years forms the nexus of this inquiry. Yet, the current landscape of MI—its efficacy, modalities, and contextual nuances in secondary schools—remains under-explored. This study endeavors to methodically examine the global application and implications of MI within secondary educational settings, aiming to elucidate strategies that might invigorate school-based PA programming.

Context

The context of the proposed study pertains to secondary educational settings globally. This study will focus on understanding MI within diverse classrooms across different countries, taking into account variations due to geographic location, cultural and sub-cultural factors, and specific racial or gender-based interests. The research seeks to delineate how MI practices and their perceived benefits might differ or align across these varied classroom settings.

Search Strategy

The search strategy aims to identify studies published in peer-reviewed journals. To find relevant articles on MI within secondary educational settings, the following databases will be searched: PubMed/MEDLINE, ERIC (EBSCOhost), SPORTDiscus, CINAHL, SCOPUS, and PsycINFO. The development of our comprehensive search strategy was informed by the text words present in the titles

and abstracts of relevant articles, as well as the index terms used to categorize them. The search approach, encompassing all identified keywords and index terms, will be adapted to suit the specificities of each database or information source. Furthermore, the study will meticulously review the reference lists of all identified sources to uncover any additional relevant studies. To ensure a concentrated approach and linguistic consistency, only studies published in English will be included, and there will be no restrictions based on the publication date. Study authors will be contacted in cases where full texts of apparently relevant articles identified in our search are unavailable.

Types of Sources

The proposed study will encompass studies using any research design. This can include experimental and quasi-experimental designs, such as randomized controlled trials, non-randomized controlled trials, and longitudinal studies; analytical observational studies, including cohort, case-control, and analytical cross-sectional studies; descriptive observational designs like case series and cross-sectional studies; qualitative designs such as phenomenology, grounded theory, ethnography, and action research; and systematic reviews fitting the criteria.

Study/Source of Evidence Selection

Upon search completion, all identified citations will be gathered and uploaded into EndNote 21 (Clarivate Analytics, PA, USA), ensuring the removal of duplicates. After a preliminary pilot test, titles and abstracts will be assessed by two independent reviewers based on the review's inclusion criteria. Sources that seem pertinent will be retrieved in full, and their citation details incorporated into the JBI System for the Unified Management, Assessment, and Review of Information (JBI SUMARI) (JBI, Adelaide, Australia). The entire text of these selected sources will undergo thorough evaluation against the inclusion criteria by two independent reviewers. Exclusion justifications for full-text sources that do not align with the criteria will be meticulously documented and featured in the scoping review. Any discrepancies between the reviewers at every step will be addressed via discussion or consultation with an additional reviewer. The entire search outcome and the evidence inclusion process will be comprehensively detailed in the final scoping review, presented through the PRISMA-ScR flow diagram.

Data Extraction

Two appointed reviewers will independently undertake the data extraction process from the identified studies using a rigorously constructed tool. This tool will detail:

1. Study Identification: Author(s), title, publication year, source/journal.
2. Participants: Descriptive information concerning sample size, demographics (e.g., gender, ethnicity), and pertinent characteristics.
3. Concept: Core notions pertaining to MI or associated terminologies, inclusive of underlying theories or models referenced.
4. Context: Specifics of the study environment (country/place of study), inclusive of geographic locale and type of institution.
5. Methodology: An outline of the research design and employed methods.
6. Data Types: Classification of the data as qualitative, quantitative, or mixed-methods.
7. Measurement Instruments: The methodologies and tools applied for data acquisition (e.g., survey, interviews, observations) and analysis.
8. Key Findings: Crucial outcomes and inferences aligned with the study's objectives.
9. Identified gaps in the research literature.

Data Analysis and Presentation

This work will be structured in a way that directly aligns with the study's objective and the posed research questions. The results will be elucidated in two distinctive manners:

Quantitative presentation:

- A comprehensive report will detail the number of studies pinpointed and selected.
- The exhaustive search strategy, including the decision-making protocols, will be transparently outlined.
- Extracted data will be systematically represented in tables and diagrams. This quantitative portrayal will be dynamic, allowing for the possible introduction of emergent categories as the review progresses.

Qualitative analysis:

- A meticulous descriptive analysis will be employed to spotlight the salient themes and pivotal concepts addressing with the proposed research questions.
- Sub-themes, if any, will be delineated and integrated into the results.
- To enhance comprehensibility and provide a cohesive understanding, graphical, tabular, and diagrammatic representations will be complemented by a narrative summary. This narrative will bridge the quantitative and qualitative findings, offering insights into how the synthesized data align with and advance the study's objectives and central questions.

Anticipated Outcomes and Plans for Continuing Research

This proposed study aims to meticulously aggregate and qualitatively synthesize research on MI in secondary school environments. The objective is not to evaluate the quality of individual studies but rather to develop a comprehensive understanding. Drawing from this, we will create a conceptual framework that captures the prevalent MI strategies identified in the literature. Specifically, the study seeks to foster a deeper understanding of MI in secondary settings, offering insights vital for effective program design, teacher professional development, and the assessment of MI initiatives in line with national PA guidelines.

Positioning itself as a pioneering effort, this study promises to offer invaluable tools for conducting empirical research on MI in secondary-level schools in future perspectives. The subsequent phase this study will involve seeking funding for a comprehensive Michigan-based research project to assess MI prevalence and its association with health and academic outcomes. This effort will highlight key intervention areas, such as rural or low socio-economic-status schools, and will form the basis for proposals of impactful trials tailored to diverse schools with significant needs. The information gleaned will also aid in refining teacher training modules and empower policymakers to make well-informed decisions.

From a professional standpoint, the study will offer a springboard for conference presentations. This research can also lead to publications in notable journals such as the *International Journal of Behavioral Nutrition and Physical Activity, BMC Public Health, Journal of School Health, Sports Medicine,* and *Journal of Physical Activity and Health*.

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