

# Inclusive physical activity for war affected adolescents: a systematic review

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

## Abstract

### Background and Study Aim

Armed conflict disrupts education, social interaction, and opportunities for physical development, adversely affecting adolescents' physical and psychosocial functioning. In post-conflict and trauma-affected contexts, inclusive physical activity is discussed as an approach that integrates rehabilitation, educational adaptation, and social participation. The aim of this study was to examine the conceptual foundations, research approaches, and reported outcomes of inclusive physical activity programs for adolescents affected by armed conflict.

### Material and Methods

A systematic review was conducted in accordance with PRISMA guidelines using the Web of Science, Scopus, and MedLine (via PubMed) databases. Publications from 2013 to 2025 were considered. The initial search identified 647 records, of which 22 peer-reviewed studies met the inclusion criteria and were included in the final synthesis. Data extraction and coding were performed independently by two reviewers following a structured protocol. Each study was classified into one of three analytical categories: fundamental (n = 6), contemporary (n = 9), or applied (n = 7). Quantitative characteristics, including publication year, study design, and thematic focus, were summarized using descriptive analysis. Qualitative synthesis was conducted using a thematic approach focusing on inclusion mechanisms, psychosocial outcomes, and contextual barriers. This mixed analytical strategy enabled integration of numerical patterns and thematic findings.

### Results

Among the 22 included studies, research most frequently focused on rehabilitation-related outcomes (45%), followed by psychological dimensions such as emotional regulation and motivation (32%), educational aspects (18%), and sport-related contexts (5%). Observational designs were predominant (59%), while qualitative approaches accounted for 18%, cross-sectional and survey-based studies for 9% each, and mixed-methods designs for 5%. Reported outcomes were clustered around physical functioning, emotional regulation, and participation. Across studies, frequently identified mechanisms included adaptive pedagogical strategies, structured activity formats, peer interaction, and self-regulation practices. Rehabilitation-focused interventions reported changes in functional capacity, mobility, and stress-related responses. Education-oriented interventions addressed motivation and elements of teacher practice, while community-based and outreach initiatives examined social belonging, resilience-related processes, and continuity of participation.

### Conclusions

Inclusive physical activity can be described as a framework that addresses physical, psychological, and social dimensions of adolescent recovery. The synthesized evidence indicates associations with educational inclusion and resilience-related processes. It also shows links to social participation in post-conflict contexts. In this way, inclusive physical activity is situated within broader processes of social reintegration.

### Keywords:

inclusive physical activity, adaptive physical education, adolescents, war trauma, rehabilitation, social inclusion, resilience.

## Introduction

Inclusive physical activity is considered within the context of post-conflict recovery and social reintegration among adolescents affected by war. Many young people experience displacement, psychological stress, or physical limitations associated with armed conflict. Recovery in such contexts involves interconnected processes of

psychological adjustment, social adaptation, and physical rehabilitation. Inclusive physical activity is examined in published research as an approach that supports functional abilities and motor skills within these processes. It is also associated with psychosocial well-being and forms of community participation during recovery.

Foundational scholarship describes inclusive physical activity for conflict-affected adolescents within integrative models that link motor rehabilitation, psychosocial adaptation, and social

participation. These approaches are commonly based on a biopsychosocial perspective combined with ecological and trauma-informed principles. Within this framework, physical activity is viewed as a means of functional recovery and as a structured setting that supports safety, agency, and peer interaction [1]. Conceptual models often propose a staged progression from protected, low-intensity engagement to community-based activities. This progression is guided by individualized goals and environmental adaptations intended to reduce activity limitations and participation barriers [2]. Recent theoretical reviews also describe the integration of inclusive physical activity into public health and education systems. In this context, adaptive exercise is aligned with mental health support and school reintegration, alongside outcomes related to motor function, self-efficacy, and social participation [3].

Other studies describe three developments related to inclusive physical activity for adolescents affected by armed conflict. First, contemporary frameworks extend inclusion beyond impairment-focused adaptation and incorporate trauma- and resilience-informed approaches. These approaches integrate psychosocial elements, including peer support, self-efficacy-related strategies, and gradual engagement in group activities within physical education and community settings [4, 5]. Second, cross-sector models that connect schools, primary healthcare, and local sport or rehabilitation services are examined in relation to activity continuity during displacement and return. These models describe the use of scalable procedures, digital tools, and family involvement to address participation discontinuity [4, 6]. Third, recent evidence highlights the role of implementation conditions. Factors such as teacher preparation, safe-space organization, and flexible assessment practices are associated with sustained participation and reduced avoidance among adolescents experiencing displacement-related stress [7]. Overall, the reviewed studies indicate that inclusion practices are more consistent when adaptive exercise progression is combined with psychosocial components and coordinated service structures.

Applied studies describe how inclusive physical activity is implemented in practice with conflict-affected adolescents. Program designs commonly include adaptable session structures, low entry thresholds, and gradual load progression. These elements are adjusted to changes in physical capacity and stress levels. Community- and school-based programs describe the use of structured peer support, consistent routines, and targeted teacher or coach preparation. These components are associated with session attendance and perceived safety during participation [8]. Intervention studies also report the feasibility of multi-component protocols. Such protocols combine aerobic and strength exercises

with self-regulation techniques, including breathing, grounding, and brief reflective tasks. Reported outcomes include changes in functional capacity, self-efficacy, and willingness to engage in group activity [9]. Program-level analyses highlight the role of continuity of support through referral links between schools, rehabilitation services, and local sports organizations. Simple monitoring tools, such as session records and brief well-being measures, are used to guide progression and address participation disruption during displacement or return [10]. Overall, these studies identify operational factors related to staff preparation, peer involvement, and the integration of psychosocial elements within physical activity programs.

Armed conflict disrupts public health systems and affects psychosocial and physical development, particularly among children and adolescents. Post-war recovery therefore involves strategies that link rehabilitation, education, and social reintegration through inclusive physical and psychosocial approaches. Recent research addresses resilience, trauma recovery, and health reconstruction in post-conflict settings. Kelmendi [11] describes resilience as a multidimensional process shaped by interactions between individual psychological adaptation and supporting social systems in youth and communities exposed to prolonged violence. Murphy [12] provides meta-analytic evidence of long-term psychological and social consequences of conflict-related violence and discusses the need for integrated interventions that connect mental health, education, and physical rehabilitation. Health sciences research extends this perspective to systemic recovery challenges. Muvaffak [13] reports that damage to health infrastructure during and after armed conflict disrupts continuity of care and limits access to rehabilitation services, as observed in post-conflict Syria. Wild [14] synthesizes evidence on coordination between humanitarian and emergency response systems and describes integrated models that combine medical care, psychosocial support, and community-based rehabilitation for survivors of explosive violence.

Together, the reviewed studies present a shared perspective that post-conflict recovery involves the restoration of physical functioning alongside social participation. In this context, inclusive physical activity is discussed as an approach that links rehabilitation with educational processes and supports participation among adolescents affected by war. Inclusive physical activity is therefore considered not only as structured exercise but also as a component of broader recovery processes that involve health, community engagement, and social reintegration.

Analysis of the literature indicates that inclusive physical activity grounded in biopsychosocial and trauma-informed principles is described

as addressing both rehabilitation-related and psychosocial dimensions. Studies report that the combination of adaptive physical education, psychosocial support, and opportunities for community participation is associated with the restoration of functional skills and renewed engagement in physical activity. At the same time, the literature points to ongoing challenges in conflict-affected settings, including infrastructure constraints, limited professional training, and issues related to program sustainability. These factors indicate the need for further research focused on context-sensitive and evidence-based models of inclusive physical activity.

The aim of this study was to examine the conceptual foundations, research approaches, and reported outcomes of inclusive physical activity programs for adolescents affected by armed conflict.

## Materials and Methods

### *Information Sources and Search Strategy*

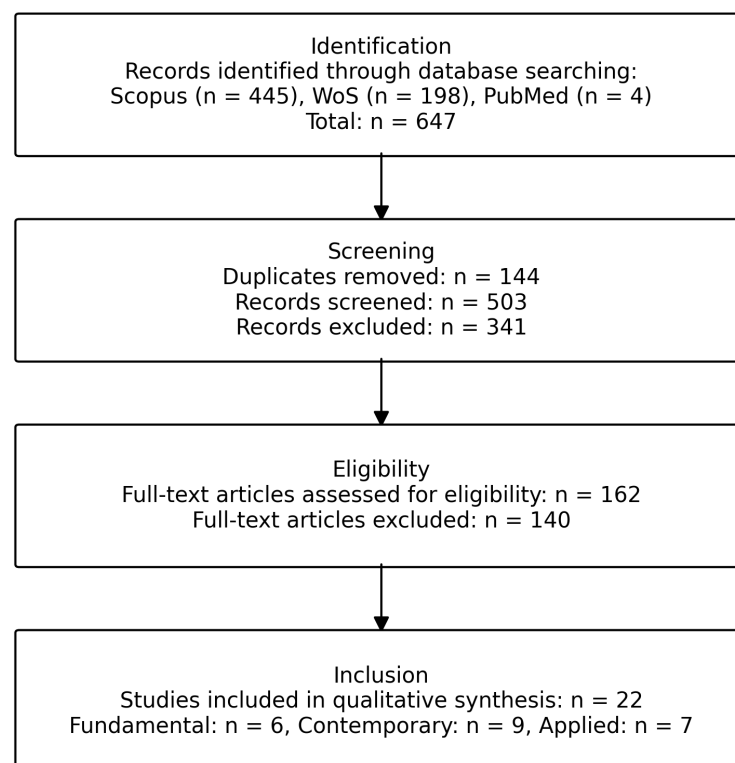
Inclusive physical activity is considered within the context of post-conflict recovery and social reintegration among adolescents affected by war. Many young people experience displacement, psychological stress, or physical limitations related to armed conflict. Recovery in such contexts involves interconnected processes of psychological adjustment, social adaptation, and physical rehabilitation. Inclusive physical activity is described as an approach that supports functional

abilities and motor skills within these processes. It is also associated with psychosocial well-being and forms of community participation during recovery.

The search covered publications from 2013 to 2025 and was conducted in accordance with the PRISMA guidelines. Predefined keyword combinations related to inclusive physical activity, adolescence, conflict, and psychosocial outcomes were applied using Boolean operators.

Eligible studies were peer-reviewed journal articles available in full text and published in English. Inclusion criteria comprised empirical studies, theoretical analyses, and systematic reviews involving adolescents aged 10–19 and reporting physical, psychosocial, or educational outcomes related to inclusion. Non-peer-reviewed materials, studies outside the scope of physical education or rehabilitation, and research focused exclusively on adult populations were excluded.

The initial search yielded 647 records (Web of Science,  $n = 198$ ; Scopus,  $n = 445$ ; PubMed,  $n = 4$ ). After duplicate removal, 503 unique records were screened, of which 341 were excluded based on topical or population-related criteria. Full-text assessment was conducted for 162 articles, resulting in 22 studies included in the final synthesis. Study selection and screening were performed independently by two reviewers. The included studies were categorized as fundamental ( $n = 6$ ), contemporary ( $n = 9$ ), or applied ( $n = 7$ ), in line with the analytical framework of the review. Figure 1 summarizes the study selection process.



**Figure 1.** PRISMA Flow Diagram

### Data Extraction and Coding

Data extraction was conducted for the 22 included studies using a standardized protocol applied independently by two reviewers with expertise in inclusive physical education and rehabilitation. For each study, bibliographic and methodological characteristics were recorded, including publication year, country, study design, target population, intervention type, and reported outcomes. Outcomes were grouped into physical, psychological, and social domains, and contextual information related to setting and professional preparation was also documented.

Data coding followed the analytical framework of the review, with each study assigned to one of three categories and variables coded numerically or thematically as appropriate. Coding reliability was confirmed through independent comparison and consensus, with high inter-rater agreement (Cohen's  $\kappa = 0.87$ ). The finalized dataset was verified for completeness and internal consistency prior to quality assessment and synthesis.

### Quality Assessment

The methodological quality and potential risk of bias of the 22 included studies were evaluated using a structured appraisal procedure adapted to different study designs. Each study was independently assessed by two reviewers who also participated in data extraction. The appraisal addressed key aspects of study quality, including sampling adequacy, clarity of intervention description, data collection procedures, outcome measurement, and coherence

between evidence and conclusions.

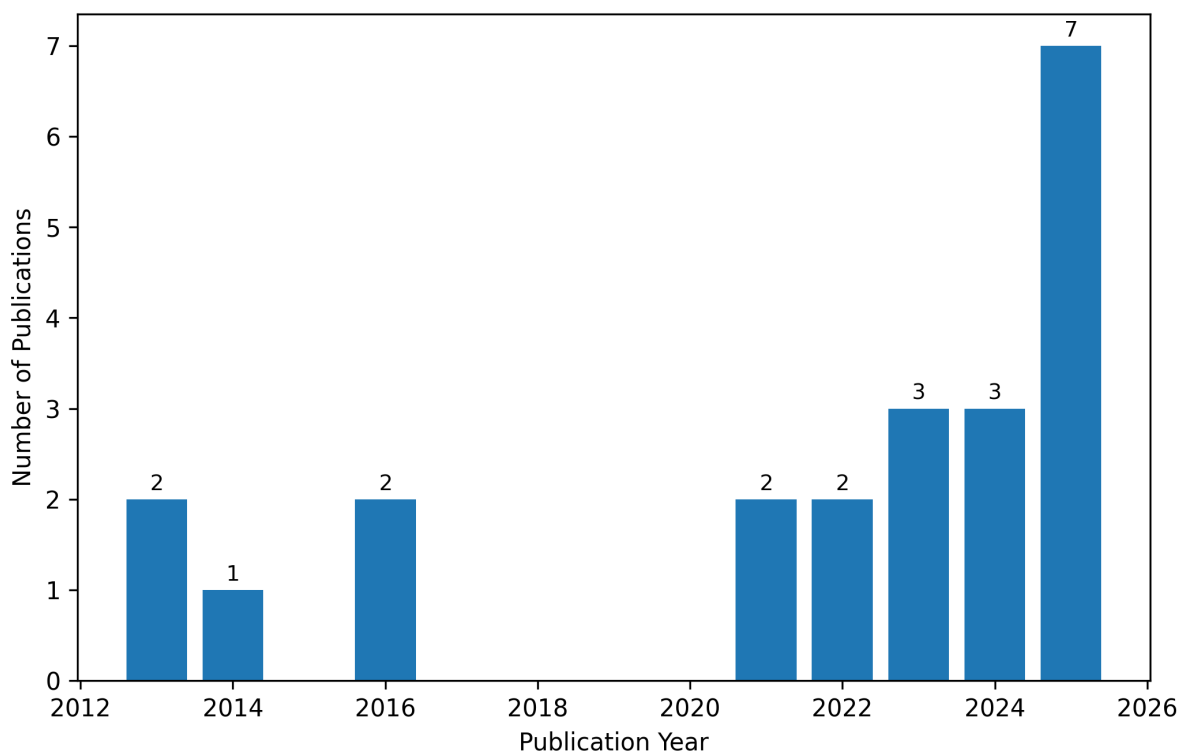
A three-level classification system was used to summarize study quality. Studies meeting at least 80% of the applicable criteria were classified as high quality, those meeting 60–79% as moderate quality, and those below 60% as low quality. Disagreements between reviewers were resolved through discussion and consensus. Inter-rater agreement was high (Cohen's  $\kappa = 0.87$ ). Based on this assessment, 15 studies (68%) were classified as high quality, 6 studies (27%) as moderate quality, and 1 study (5%) as low quality.

### Data Analysis and Synthesis

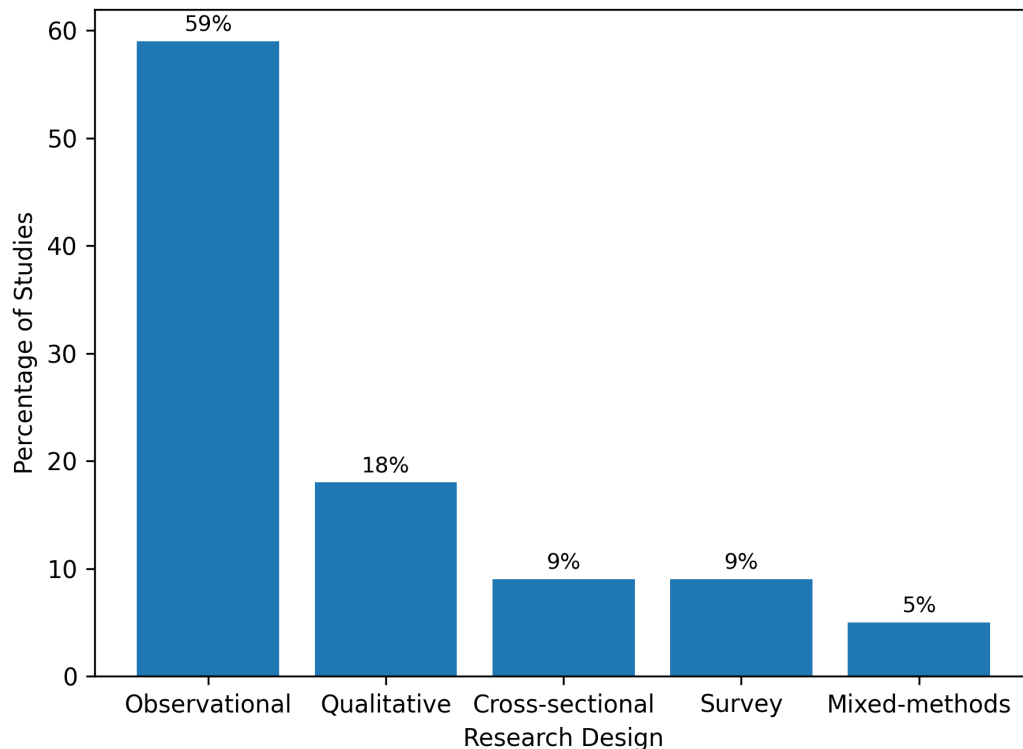
The analysis combined quantitative and qualitative procedures to synthesize evidence on inclusive physical activity for adolescents affected by armed conflict. This mixed approach allowed descriptive summarization of study characteristics alongside structured integration of conceptual and contextual findings.

Descriptive analysis was used to examine the distribution of key study attributes across the 22 included publications, including publication year, study design, participant characteristics, and intervention type. Frequency distributions and temporal patterns were calculated to summarize research trends in inclusive physical activity and rehabilitation within conflict related contexts (Figures 2 and 3).

Qualitative synthesis was conducted using an inductive thematic approach. Full text data and extracted variables related to inclusion mechanisms,



**Figure 2.** Temporal Distribution of Publications (2013–2025)



**Figure 3.** Distribution of Studies by Research Design

psychosocial outcomes, pedagogical strategies, and participation barriers were coded iteratively. Identified themes were organized into three analytical categories, fundamental, contemporary, and applied, to capture recurring patterns and conceptual relationships across studies.

All analytical procedures were performed independently by two researchers and subsequently cross checked to ensure consistency. Quantitative and qualitative findings were integrated through narrative synthesis to examine relationships between numerical distributions and thematic patterns.

#### *Study Design*

This study was designed as a systematic review. The review process consisted of sequential stages including literature identification, screening, eligibility assessment, and final inclusion of studies. Eligible publications were classified by study design type, geographical context, participant characteristics, intervention setting, and thematic focus to support structured synthesis. Study designs were recorded as observational, qualitative, cross-sectional, survey-based, or mixed-methods. Participant information included age range and sample size where reported, with adolescents defined as individuals aged 10–19 years. Study settings were categorized as educational, rehabilitation or clinical, community or outreach, or unspecified. Each included study was additionally assigned to one thematic category reflecting its primary focus, namely rehabilitation, psychology, education, or sport. Quality appraisal results were used to describe

the methodological profile of the included evidence but were not used to exclude studies.

## **Results**

Detailed characteristics of the included studies, including publication year, study design, sample characteristics, and reported outcomes, are summarized in Table 1.

The main findings can be grouped into five thematic areas.

- *Rehabilitation-focused.* Rehabilitation-oriented studies describe two interconnected pathways: gradual recovery of physical function and psychosocial stabilization. Programs combining structured activity with predictable routines, brief self-regulation elements, and peer support are associated with reduced stress-related responses and improved engagement. These approaches appear to support re-entry into group activity after displacement or trauma and are linked to lower dropout rates and more stable participation [2, 15, 16].
- *Education-focused.* School-based evidence highlights the role of inclusive pedagogy, including task differentiation, flexible assessment, and planned peer interaction. Teacher preparedness in trauma-informed practices and adaptive progression is consistently linked to motivation and attendance. Qualitative findings indicate higher self-efficacy and participation when educators co-design activities with students and integrate simple regulation strategies, alongside reported

**Table 1.** Characteristics of Included Studies.

No	Country/ Region	Study Design	Participants (Age, N)	Setting/ Context	Aim/ Objectives	Type of Inclusion / Intervention	Analytical Group	Duration	Measured Outcomes	Main Results	Thematic Category	Quality Rating	Notes
[1]	Not specified	Observational	Adolescents (age not specified; N not specified)	School-based	To review psychosocial and mental health interventions for conflict-affected youth	Post-conflict psychosocial rehabilitation	Rehabilitation-focused	Not specified	Health, mental health	Limited evidence on intervention effectiveness reported	Rehabilitation	Moderate	Reviews psychosocial and mental health interventions
[2]	Not specified	Observational	Adolescents (age not specified; N not specified)	School-based / health services	To examine service delivery models for pediatric concussion and mild traumatic brain injury	Rehabilitation-oriented health services	Rehabilitation-focused	Not specified	Health, rehabilitation	Limited evaluation of service delivery models reported	Rehabilitation	Moderate	Addresses rehabilitation and inclusion in adaptive care models
[8]	Not specified	Observational	Adolescents (age not specified; N not specified)	Rehabilitation / clinical	To explore factors influencing inclusive physical activity	Rehabilitation / therapy program	Rehabilitation-focused	12 weeks	Motivation, participation, rehabilitation	Engagement described as multifaceted beyond enjoyment	Rehabilitation	Moderate	Examines complexity of participation in rehabilitation contexts
[15]	Not specified	Cross-sectional	Adolescents (8–13 yrs; N not specified)	School-based	To identify determinants of sport dropout	Post-conflict / reintegration-oriented activity	Rehabilitation-focused	1 year	Participation, stress	High dropout associated with psychosocial factors	Psychology	Moderate	Focus on resilience, stress, and motivation
[16]	Not specified	Observational	Adolescents (age not specified; n =4)	Rehabilitation / clinical	To assess the effects of ATCS on behavioural, clinical, and patient-related outcomes	Post-conflict / rehabilitation-oriented intervention	Rehabilitation-focused	6 months	Health, performance, stress	Reported outcomes varied across conditions	Education	Moderate	Focus on inclusive education and professional practice

Table 1. Continued

No	Country/ Region	Study Design	Participants (Age, N)	Setting/ Context	Aim/ Objectives	Type of Inclusion / Intervention	Analytical Group	Duration	Measured Outcomes	Main Results	Thematic Category	Quality Rating	Notes
[17]	UK	Qualitative	Children and adolescents (2–17 yrs; N not specified)	School-based	To examine parents' perceptions of electronic device use for physical activity	Technology-supported physical activity	Rehabilitation-focused	1 year	Health, motivation	Positive perceptions of device-supported physical activity reported	Education	Moderate	Addresses digital tools for physical activity in educational contexts
[18]	Not specified	Observational	Children and adolescents (5–18 yrs; n = 6812)	School-based	To assess the effects of summer holiday programs on mental health and social-emotional outcomes	Program-based psychosocial support	Rehabilitation-focused	1 year	Health, stress	Improvements in mental health and social-emotional outcomes reported	Education	Moderate	Examines non-academic outcomes of structured activity programs
[19]	Not specified	Observational	Adolescents (10–17 yrs; N not specified)	Community / outreach	To map evidence on peer support interventions for youth prevention programs	Peer support-based psychosocial intervention	Rehabilitation-focused	1 year	Health	Evidence and contextual use of peer support interventions summarized	Rehabilitation	Moderate	Reviews peer support approaches in community settings
[20]	Not specified	Mixed-methods	Adolescents (9–16 yrs; N not specified)	Rehabilitation / clinical	To synthesize evidence on effects and experiences of leisure-time physical activity	Training / exercise intervention	Exercise-focused	Not specified	Health	Effects on positive mental health varied by activity type and outcome	Psychology	Moderate	Examines leisure-time physical activity and mental health outcomes
[21]	Not specified	Observational	Adolescents (age not specified; N not specified)	Rehabilitation / clinical	To review clinical practice guidelines for treating child and adolescent obesity	Training / exercise intervention	Exercise-focused	Not specified	Health	Variability and gaps identified across obesity treatment guidelines	Psychology	Moderate	Reviews guideline-based approaches relevant to clinical rehabilitation

Table 1. Continued

No	Country/ Region	Study Design	Participants (Age, N)	Setting/ Context	Aim/ Objectives	Type of Inclusion/ Intervention	Analytical Group	Duration	Measured Outcomes	Main Results	Thematic Category	Quality Rating	Notes
[22]	Not specified	Qualitative	Children and adolescents (<18 yrs; N not specified)	School-based/ post-conflict	To review quantitative research on psychosocial adjustment and mental health among conflict- associated children	Post-conflict psychosocial rehabilitation	Rehabilitation- focused	1 year	Health	Studies varied in quality according to SAQOR criteria	Psychology	Moderate	Reviews mental health outcomes among conflict- affected youth
[23]	USA	Qualitative	Adolescents (age not specified; n = 65)	Not specified	To describe experiences of children in military families affected by parental PTSD	Psychosocial support in post-conflict contexts	Rehabilitation- focused	Not specified	Stress	Family stress and psychosocial impacts described across thematic categories	Rehabilitation	Moderate	Examines family- related psychosocial effects relevant to rehabilitation
[24]	Not specified	Observational	Adolescents (age not specified; N not specified)	School-based/ clinical	To assess the effects of psychological therapies on PTSD-related outcomes after trauma	Trauma- focused psychological intervention	Rehabilitation- focused	1 year	Health, stress	Some evidence reported for PTSD symptom reduction	Rehabilitation	Moderate	Reviews psychological therapies relevant to post-trauma rehabilitation
[25]	Not specified	Observational	Adolescents (age not specified; N not specified)	Not specified	To examine the effects of exercise across health- related outcomes	Rehabilitation- oriented exercise intervention	Rehabilitation- focused	Not specified	Health	Inconsistent findings reported across existing evidence	Psychology	Moderate	Addresses evidence synthesis and outcome variability
[26]	Not specified	Observational	Adolescents (age not specified; N not specified)	Not specified	To describe participation in social and physical leisure activities and related determinants	Rehabilitation- oriented participation support	Rehabilitation- focused	Not specified	Health, participation	Participation patterns and determinants summarized	Rehabilitation	Moderate	Examines leisure participation and inclusion factors

Table 1. Continued

No	Country/ Region	Study Design	Participants (Age, N)	Setting/ Context	Aim/ Objectives	Type of Inclusion / Intervention	Analytical Group	Duration	Measured Outcomes	Main Results	Thematic Category	Quality Rating	Notes
[27]	Not specified	Observational	Adolescents and young adults (age not specified; n = 4519)	Rehabilitation / clinical	To examine associations between age, physical activity patterns, pubertal timing, BMI, and ACL injury risk	Injury risk assessment in rehabilitation contexts	Rehabilitation- focused	18 months	Rehabilitation	Higher ACL injury risk associated with age, vigorous activity, overweight/ obesity, and advanced pubertal stage	Rehabilitation	Moderate	Examines injury risk factors relevant to rehabilitation practice
[28]	Not specified	Observational	Youth (13–17 yrs; N not specified)	Not specified	To examine associations between family functioning domains and youth physical activity	Family- context- related physical activity	Rehabilitation- focused	Not specified	Health	Small associations reported between physical activity and family cohesion, communication, and conflict	Sport	Moderate	Examines family context factors related to youth physical activity
[29]	Not specified	Qualitative	Adolescents (10–19 yrs; N not specified)	School-based	To explore factors influencing inclusive physical activity	Post-conflict / inclusion- oriented physical activity	Rehabilitation- focused	1 year	Not specified	Factors related to inclusion in physical activity described	Psychology	Moderate	Examines psychosocial factors influencing inclusion
[30]	Not specified	Survey	Adolescents (age not specified; n = 89)	Rehabilitation centers (educational context)	To examine mental health dimensions among incarcerated youth in rehabilitation settings	Rehabilitation / therapy program	Rehabilitation- focused	Not specified	Health, rehabilitation, stress	Mental health vulnerabilities reported among incarcerated youth	Rehabilitation	Moderate	Focuses on mental health and inclusion in rehabilitation contexts

Table 1. Continued

No	Country/Region	Study Design	Participants (Age, N)	Setting/Context	Aim/Objectives	Type of Inclusion/Intervention	Analytical Group	Duration	Measured Outcomes	Main Results	Thematic Category	Quality Rating	Notes
[31]	USA	Cross-sectional	Adolescents (12–17 yrs; N not specified)	School-based	To examine associations between social network use, messaging apps, addictive behaviors, and sleep problems	Psychosocial and digital behavior-related factors	Rehabilitation-focused	1 year	Health	Associations reported between social network use and sleep-related problems	Education	Moderate	Examines digital behavior and well-being in educational contexts
[32]	Canada	Observational	Adolescents (age not specified; N not specified)	Rehabilitation / clinical	To review the effects of mental health treatments delivered in youth-friendly and integrated youth service clinics	Mental health-oriented rehabilitation services	Rehabilitation-focused	1 year	Health	Study protocol describing planned synthesis and dissemination	Psychology	Moderate	Protocol focusing on mental health services for adolescents
[33]	Not specified	Survey	Adolescents (age not specified; n = 14)	School-based	To examine associations between sport-related concussion and violence-related behaviors	Rehabilitation-oriented school support	Rehabilitation-focused	12 months	Not specified	Associations reported between concussion history and behavioral outcomes	Rehabilitation	Moderate	Addresses psychosocial and behavioral aspects in school contexts

changes in motivation and stress indicators [16, 17, 18].

- *Community-focused.* Community and outreach programs address participation continuity beyond school settings. Logistical supports, caregiver involvement, and informal peer networks are described as factors associated with sustained engagement. Although only one study met explicit community-based criteria, it reported contextual and health-related changes linked to accessible programming and local resource coordination, while also noting challenges related to staffing and safe space availability [19].
- *Exercise/training-focused.* Studies emphasizing exercise prescription report higher adherence when programs use low-entry thresholds, brief work intervals, and feedback on progress. Motivation is commonly linked to perceived competence and peer encouragement. Reported outcomes include changes in health, physical performance, and affect, particularly when exercise intensity is adjusted and alternative tasks are available during periods of symptom fluctuation [20, 21].
- *Cross-cutting themes.* Across categories, three recurring themes emerge: inclusivity through task and environmental adaptation; psychosocial well-being, including stress regulation and safety cues; and equity in access for displaced or trauma-affected adolescents. The synthesis suggests that inclusive physical activity functions as a coordinated approach that links physical progression with predictable structure and relational support across educational, rehabilitation, and, where available, community contexts.

The methodological quality of the 22 studies included in the synthesis was classified as moderate. All studies met baseline requirements for validity and reporting transparency, although methodological approaches varied and longitudinal designs were limited. Most investigations reported clearly defined objectives, appropriate sampling strategies, and coherent analytical procedures. Mixed-methods designs were frequently used, allowing the documentation of both measurable outcomes, such as functional recovery, activity participation, and psychological adaptation, and qualitative aspects of inclusion. Several studies also employed multi-site or multi-country designs, contributing to contextual diversity within the dataset.

## Discussion

The aim of this study was to examine theoretical, methodological, and applied aspects of inclusive physical activity programs for adolescents affected by armed conflict, with attention to physical rehabilitation, social participation,

and psychological adaptation. The synthesized findings indicate that inclusive physical activity is associated with changes in motor function, stress regulation, and motivation among conflict-affected adolescents. Rehabilitation-oriented interventions were linked to functional and emotional outcomes. Education-based programs addressed participation and aspects of teacher preparedness. Community-focused initiatives were reported less frequently but described continuity of participation and peer-related support within local contexts.

These findings align with the view of inclusive physical activity as a multidimensional system that integrates rehabilitative, psychosocial, and educational components. In post-conflict contexts, inclusive physical activity is discussed not only as structured exercise but also as a context for restoring safety, self-efficacy, and social participation among adolescents. The convergence of evidence across different study designs supports theoretical models that conceptualize physical inclusion as part of broader recovery processes. Previous research similarly emphasizes that post-conflict recovery depends on the coordinated integration of physical rehabilitation, psychosocial support, and institutional collaboration across education and health sectors [11, 12, 13, 14]. From this perspective, inclusive physical activity contributes to recovery by linking functional health restoration with social reintegration and resilience-related processes.

Evidence highlights the interrelated nature of psychological recovery, physical activity, and social reintegration among adolescents affected by conflict and adversity. Across contexts, studies converge on the view that resilience and inclusion are not achieved through isolated interventions but require coordinated strategies linking mental health support, family involvement, and accessible opportunities for physical activity. Within this framework, the reviewed literature can be grouped into several thematic areas.

*Psychosocial Rehabilitation and Trauma Recovery.* Studies consistently emphasize the role of psychosocial interventions in supporting adolescents exposed to violence, displacement, or family-related trauma [22, 23, 24]. Recovery-oriented programs commonly combine mental health support with community and family engagement. Evidence indicates that adolescents affected by war-related stress benefit from approaches that integrate psychological care with structured physical or social activity. Such models are associated with improved emotional regulation, self-efficacy, and social participation, which are frequently described as components of post-conflict resilience.

*Physical Activity, Health, and Cognitive Function.* Research examining physical activity and health outcomes reports associations with psychological well-being, cognitive functioning, and general

health among children and adolescents [25, 26, 27]. Structured exercise and recreational programs are described as beneficial across diverse groups, including youth with chronic conditions. When safety measures and task adaptations are applied, participation in physical activity is also discussed as a protective factor, supporting both rehabilitative and preventive health processes.

*Family, Social, and Environmental Factors.* Several studies address the relationship between family functioning, social support, and adolescent health-related behaviors [28, 29, 30]. Supportive family communication and stable social networks are associated with better emotional adjustment and higher levels of physical activity. In contrast, family instability and social disruption are linked to behavioral and mental health challenges, particularly in post-conflict settings. These findings support the inclusion of family-oriented components within inclusive education and rehabilitation frameworks.

*Digital Health, Prevention, and Systemic Approaches.* Recent literature explores the use of digital tools and preventive systems to support adolescent well-being [16, 31, 32, 33]. Technology-assisted interventions are described as expanding access to support and facilitating engagement. At the same time, excessive digital use is associated with sleep-related and behavioral difficulties, indicating the need for balanced implementation. The reviewed studies suggest that digital solutions are most effective when combined with in-person inclusion practices and appropriate guidance.

Taken together, the evidence indicates that adolescent recovery and inclusion are shaped by the interaction of psychosocial, physical, family, and contextual factors. In post-conflict settings, the findings support integrated approaches that link health, education, and community systems through inclusive and context-sensitive physical activity.

The synthesis of theoretical and empirical evidence presents a multifaceted view of inclusive physical activity as a component of rehabilitation, psychosocial recovery, and educational reintegration among adolescents affected by armed conflict. Within this framework, three analytical perspectives can be distinguished: rehabilitation-focused, education-focused, and community-focused.

*Rehabilitation-focused perspective.* Biopsychosocial rehabilitation theories [1] and adaptive activity models [2] propose that structured physical activity supports post-traumatic adaptation by linking physical reactivation with emotional regulation. The present synthesis is consistent with these assumptions. Empirical studies report that inclusive rehabilitation programs combining gradual motor progression with stress-regulation components are associated with reduced anxiety and increased participation [15, 20, 22, 24, 25]. Differences across studies relate mainly to outcome emphasis, with

some focusing on physiological indicators and others on subjective well-being and social re-engagement [26, 27]. Across designs, rehabilitation-oriented inclusion is linked to improvements in physical function and perceived safety in group settings, aligning with theoretical models of adaptive physical culture [3, 23, 30].

*Education-focused perspective.* Inclusive pedagogy frameworks position schools as central environments for psychosocial reconstruction. Recent evidence highlights the role of teacher competence, empathy, and adaptive instructional design in supporting participation of trauma-affected students in physical education [17, 18, 22, 24, 32]. In line with theoretical perspectives on inclusive education [34], engagement appears higher when educators combine structured routines with flexibility and integrate socioemotional elements into lessons [28, 29]. At the same time, variation in teacher preparation contributes to uneven outcomes across settings. Some schools implement differentiated tasks and peer support effectively, while others face constraints related to limited training and resources [23, 30]. These findings point to the relevance of sustained professional development and institutional support for inclusive practice [26, 33].

Although community-based programs are less frequently examined, available studies indicate that local activity networks contribute to sustained engagement beyond school or clinical settings [6, 19]. Youth centers, outreach sports clubs, and rehabilitation camps emphasize peer support and psychosocial safety rather than performance outcomes [22, 23]. Qualitative findings suggest that continuity of participation, even at low intensity, is associated with resilience, belonging, and emotional stability [30, 32]. Compared with institutional models, community approaches offer flexibility but face challenges related to supervision and funding stability [31, 33]. The evidence therefore supports intersectoral collaboration linking schools, health services, and community organizations to maintain inclusion across transitions [14, 16].

Taken together, these three perspectives indicate that inclusive physical activity operates most effectively when rehabilitation, education, and community contexts are interconnected. The findings suggest that recovery and inclusion among conflict-affected adolescents depend on coordinated approaches that align physical rehabilitation with pedagogical support and sustained opportunities for participation across settings.

Studies examining structured exercise interventions report higher adherence and motivation when programs include choice, feedback, and individualized progression [20, 21, 25, 26]. Physical performance gains are generally modest but consistent, whereas psychosocial outcomes,

including self-image, confidence, and perceived competence, are more pronounced [27, 28]. This overlap between exercise and rehabilitation domains suggests that the therapeutic value of physical activity is linked less to performance outcomes and more to social connectedness and agency, which corresponds to socio-constructivist models of inclusion [4, 32, 33].

Across analytical dimensions, three interconnected theoretical principles can be identified. First, embodied inclusion highlights the role of movement experiences in restoring agency and perceptions of safety following trauma. Second, educational contextualization situates inclusion within predictable and relationally secure environments rather than isolated interventions. Third, multilevel coordination among educational, rehabilitative, and community systems is associated with equity in access and sustained participation. Together, these principles align with conceptual models that describe inclusive physical culture as an integrated framework combining rehabilitation, pedagogy, and social integration [2, 3].

At the same time, variability in program duration, cultural context, and assessment approaches indicates that inclusive physical activity remains an evolving field. While research from Western and North American contexts often emphasizes individualized adaptive models, studies conducted in Eastern European and post-conflict settings more frequently focus on psychosocial recovery and collective resilience. This divergence underscores the importance of developing culturally responsive and methodologically comparable approaches for evaluating inclusive physical activity across contexts.

The synthesis indicates that inclusive physical activity functions as a multidimensional context for physical rehabilitation, psychosocial adaptation, and educational reintegration among adolescents affected by war. Evidence from rehabilitation-, education-, community-, and training-focused studies suggests that inclusive practice extends beyond physical exercise to include emotional regulation, social participation, and the restoration of agency through movement. The convergence of theoretical perspectives [1, 2] and empirical findings [15, 18] supports the view that structured and supportive movement contexts contribute to recovery processes that involve both bodily and psychosocial dimensions.

From a theoretical standpoint, these findings position inclusive physical culture as an integrated pedagogical and therapeutic framework that combines motor learning, psychosocial development, and participation within educational and community environments. Empirical evidence indicates that schools, rehabilitation services, and community organizations can apply inclusive

physical activity as a coordinated approach when supported by appropriate teacher preparation, accessibility measures, and psychosocial support structures. Across contexts, inclusive physical activity is thus described as a flexible framework that links physical development with social engagement and psychological adaptation, rather than as a narrowly defined form of adaptive exercise.

Overall, this review integrates theoretical and empirical evidence on inclusive physical activity for adolescents affected by armed conflict and related post-conflict contexts. The findings support the interpretation of inclusive physical activity as a multidimensional practice that links physical rehabilitation with psychosocial adaptation and educational participation. Across rehabilitation, educational, and exercise-oriented studies, inclusive activity is described as a context in which movement, social interaction, and structured support interact to facilitate recovery processes. Within this framework, inclusive physical activity is positioned not as an isolated intervention but as a component of coordinated rehabilitation and inclusion pathways for conflict-affected youth.

#### *Limitations and Future Research Directions*

Several limitations should be considered when interpreting the findings of this review. The synthesis was based on 22 peer-reviewed studies, many of which employed cross-sectional or short-term observational designs, limiting causal inference and assessment of long-term effects. Most studies were conducted in diverse international and post-conflict contexts rather than within a single national setting. Conceptual heterogeneity, inconsistent definitions of inclusion, and variability in outcome measures constrained comparability across studies. In addition, the focus on English-language publications and the exclusion of gray literature may have resulted in the omission of regionally relevant evidence.

Future research should address these limitations by applying longitudinal and mixed-methods designs to examine sustained effects on physical rehabilitation, psychosocial adaptation, and educational integration. The development of standardized and culturally responsive indicators that integrate physical and psychosocial outcomes would enhance comparability and practical relevance. Further theoretical refinement of trauma-informed and socio-ecological frameworks is also needed to better reflect the complex and context-dependent experiences of adolescents affected by armed conflict.

#### **Conclusions**

Inclusive physical activity represents a multidimensional framework that unites rehabilitation, education, and psychosocial

development in the recovery of adolescents affected by war. Its conceptual foundation lies at the intersection of rehabilitation science, pedagogy, and social integration, where movement becomes both a means of restoring agency and a medium of social cohesion.

The reviewed evidence supports a theoretical understanding of inclusive physical culture as a trauma-informed and context-sensitive approach that integrates physical development with emotional stability and community belonging. Implementing such frameworks within national education and

health systems promotes a culture of equity, dignity, and sustainable well-being.

In the broader post-war context, inclusive physical activity should be regarded as a strategic element of rebuilding human potential. By aligning educational, social, and health policies, it can contribute to the formation of resilient communities and to the renewal of social and civic life through movement.

### Conflict of interests

The authors declare that there is no conflict of interests.

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