

SYSTEMATIC REVIEW

Digital Participatory Research with Children and Adolescents: A Systematic Review of Methodological Trends and the Emergence of Health-Focused Practices

Investigación Participativa Digital con Niños, Niñas y Adolescentes: Revisión Sistemática de Tendencias Metodológicas y Emergencia de Prácticas en Salud

Iván Claudio Suazo-Galdamés¹ , Alain Manuel Chaple-Gil¹ , Mahia Saracostti²  

¹Universidad Autónoma de Chile. Chile.

²Universidad de Chile. Chile.

Cite as: Suazo-Galdamés IC, Chaple-Gil AM, Saracostti M. Digital Participatory Research with Children and Adolescents: A Systematic Review of Methodological Trends and the Emergence of Health-Focused Practices. *Seminars in Medical Writing and Education*. 2025; 4:684. <https://doi.org/10.56294/mw2025684>

Submitted: 05-06-2025

Revised: 10-08-2025

Aceptado: 25-10-2025

Publicado: 26-10-2025

Editor: PhD. Prof. Estela Morales Peralta 

Corresponding Author: Mahia Saracostti 

ABSTRACT

This systematic review analyzes 23 empirical studies conducted between 2000 and 2025 that engaged children and adolescents as co-researchers in participatory research projects using digital tools. Applying PRISMA 2020 guidelines, the studies were selected from Scopus, Web of Science, and EBSCOhost databases. Using CASP criteria and RStudio for thematic synthesis, the review reveals how digital methodologies such as photovoice, participatory GIS, and digital storytelling facilitated co-researcher roles and enhanced empowerment, critical thinking, and civic identity among youth. A significant proportion of the studies focused on health-related topics, including physical activity, mental health, and nutrition, highlighting the transformative outcomes of youth-led inquiry in these domains. Despite the overall methodological robustness and positive outcomes, limitations were noted in reflexivity, reporting transparency, and inclusion of studies from Latin America. The review underscores the potential of participatory digital research to democratize knowledge production in health and calls for greater geographical and methodological inclusiveness.

Keywords: Participatory Research; Youth Empowerment; Digital Tools; Health Research; Co-Research; Systematic Review; Child Participation; Digital Inclusion.

RESUMEN

Esta revisión sistemática analiza 23 estudios empíricos realizados entre 2000 y 2025 que involucraron a niños, niñas y adolescentes como co-investigadores en procesos de investigación participativa mediante herramientas digitales. Siguiendo los lineamientos PRISMA 2020, la selección incluyó estudios en inglés y español obtenidos de Scopus, Web of Science y EBSCOhost. A partir de criterios CASP y un análisis temático con RStudio, se identificaron metodologías digitales como fotovoz, SIG participativos y narrativas digitales que facilitaron la participación activa, el empoderamiento, el pensamiento crítico y la identidad cívica de los jóvenes. Una parte sustancial de los estudios se centró en temas de salud como actividad física, salud mental y nutrición, evidenciando el impacto transformador de la co-investigación juvenil en estos ámbitos. A pesar de su calidad metodológica, se observaron limitaciones en reflexividad, transparencia en la descripción metodológica y ausencia de estudios latinoamericanos. La revisión subraya el potencial democratizador de la investigación participativa digital en salud y la necesidad de ampliar su inclusión geográfica y metodológica.

Palabras clave: Investigación Participativa; Empoderamiento Juvenil; Herramientas Digitales; Investigación en Salud; Co-Investigación; Revisión Sistemática; Participación Infantil; Inclusión Digital.

INTRODUCTION

The participation of children and adolescents (C&A) in research processes has gained increasing relevance within contemporary social science, particularly under participatory and intergenerational approaches. This methodological shift acknowledges C&A not merely as subjects of study but as epistemic agents capable of actively contributing to the production of knowledge about the realities that affect them. In this context, the use of digital tools has emerged as a key resource to facilitate such participation, opening new opportunities for meaningful involvement across different stages of the research process.

In educational settings, this shift acquires particular significance as it aligns with broader pedagogical goals aimed at fostering critical thinking, inquiry-based learning, and active citizenship from an early age. Developing research skills in childhood not only contributes to a deeper understanding of social realities but also strengthens school engagement and the capacity for collective problem-solving.⁽¹⁾ By participating in authentic research processes, children and adolescents can cultivate competencies such as formulating questions, collecting and analyzing data, and communicating findings skills that are increasingly recognized as essential for 21st-century education. Consequently, participatory research with C&A represents not only a methodological innovation in social sciences but also a powerful educational strategy for promoting scientific literacy and agency in school contexts.

This principle is grounded in international frameworks, such as the United Nations Convention on the Rights of the Child (UNCRC, 1989), and recent developments in Chilean legislation most notably Law 21.430 which explicitly affirms the right of children and adolescents to be heard and to participate in matters that impact their lives.⁽²⁾ Nevertheless, the effective implementation of this principle in research faces numerous cultural, methodological, and ethical barriers, particularly in Latin American contexts, where adult-centered conceptions and hierarchical structures continue to limit young people's autonomy.^(3,4)

In response to these limitations, several scholars argue that co-research with C&A where they are involved as co-investigators (COI) enhances the social, epistemological, and transformative value of research.^(5,6) This modality has demonstrated benefits in terms of empowerment, critical skill development, and strengthened civic identity,⁽⁷⁾ as well as in the relevance and impact of resulting interventions, particularly when supported by digital technologies.^(8,9) Tools such as photovoice, collaborative platforms, and digital participatory mapping have allowed young people to document, analyze, and communicate their perspectives autonomously and creatively, helping to amplify their voices in processes traditionally dominated by adults.^(10,11)

However, the literature also reveals persistent challenges. These include difficulties in sustaining youth participation through later stages of research, limited methodological reflection on the balance of power between adults and children, and the lack of robust evaluation of the outcomes of such participatory approaches.^(12,13) Furthermore, studies from Latin America remain underrepresented, which hinders the contextual generalizability of findings and leaves regional sociocultural specificities insufficiently explored.^(14,15)

Within this broader landscape, participatory research involving children and adolescents in developing digital interventions has gained attention, but challenges remain. Studies have explored various approaches, including community-based participatory research, co-design, and user-centered design.⁽¹⁶⁾ While these methods can help shape intervention design and improve engagement, sustainable participation is difficult to achieve.⁽¹⁷⁾ Researchers face challenges in balancing their assumptions with those of young participants.⁽¹⁸⁾ Despite potential benefits, such as increased interest in health research and a sense of impact on pediatric healthcare,⁽¹⁹⁾ the value of participatory research remains unclear due to a lack of outcome data and implementation following piloting.⁽¹⁷⁾ Additionally, there is a need for more involvement of young co-researchers in later stages of participatory approaches and improved reporting of these methods.⁽¹⁶⁾

Given this context, there is a pressing need to examine how participatory research with C&A particularly when mediated by digital technologies has been carried out, what kinds of experiences have been documented, and how the effects of these interventions are being assessed. Likewise, by examining digital co-research experiences with children and adolescents, this study situates itself at the intersection of education, technology, and health—three key areas for comprehensive development in contemporary contexts. These research practices not only foster scientific literacy and civic participation from an early age but also open opportunities to generate more inclusive, culturally relevant, and sustainable interventions in areas such as mental health, well-being promotion, and digital equity. In this way, a more holistic understanding is advanced regarding the role that children and adolescents can play in producing knowledge oriented toward collective well-being. To address this gap, this systematic review synthesizes and critically analyzes existing empirical studies that incorporate C&A as co-researchers in digital contexts. Special attention is paid to the methodological strategies adopted, the outcomes reported, and the ways in which impact and effectiveness are evaluated, contributing to a broader understanding of the potential and limitations of these participatory practices. In doing so, this review aims to support the development of more inclusive, relevant, and sustainable research approaches that recognize children and adolescents as rights-holders and legitimate producers of knowledge.

METHOD

This systematic review was conducted following the PRISMA 2020 guidelines.⁽²⁰⁾ The search strategy and selection process were guided by a predefined protocol designed to identify and analyze participatory research experiences involving children and adolescents (under 18 years old) that incorporated digital tools. This systematic review was registered in PROSPERO with the number CRD420251031230.

Inclusion and Exclusion Criteria

Studies were included if they met the following criteria: empirical research (qualitative, quantitative, or mixed methods), publication date between 2000 and 2025, involvement of children and adolescents as active co-researchers and explicit use of digital tools (apps, tablets, platforms, etc.). Studies were excluded if they involved only observational research without active participation of minors, lacked use of digital tools, were theoretical or editorial in nature, or were published before 2000.

Search strategy

The search was carried out in April 2025. Searches were performed in three primary databases: Scopus, Web of Science (WoS), and EBSCOhost. The latter was used specifically to access relevant sources from ERIC and other databases significant to the topic. A combination of keywords in English was applied using Boolean operators.

Table 1. Search Queries

Database	Formulation	Filters
WoS	TS=(“children” OR “adolescents” OR “youth” OR “teenagers” OR “young people” OR “young researchers” OR “co-researchers”) AND TS=(“co-research” OR “participatory research” OR “participatory action research” OR “youth-led research” OR “participatory methodology” OR “digital tools” OR “digital participation” OR “collaborative research”) AND TS=(“impact” OR “effectiveness” OR “benefits” OR “empowerment” OR “learning outcomes” OR “agency” OR “community change” OR “capacity building”)	
Scopus	TITLE-ABS-KEY(“children” OR “adolescents” OR “youth” OR “teenagers” OR “young people” OR “young researchers” OR “co-researchers”) AND TITLE-ABS-KEY(“co-research” OR “participatory research” OR “participatory action research” OR “youth-led research” OR “participatory methodology” OR “digital tools” OR “digital participation” OR “collaborative research”) AND TITLE-ABS-KEY(“impact” OR “effectiveness” OR “benefits” OR “empowerment” OR “learning outcomes” OR “agency” OR “community change” OR “capacity building”)	AND (LIMIT-TO (DOCTYPE , “ar”))
EBSCOhost	(AB children OR AB adolescents OR AB youth OR AB teenagers OR AB “young people” OR AB “young researchers” OR AB “co-researchers”) AND (AB “co-research” OR AB “participatory research” OR AB “participatory action research” OR AB “youth-led research” OR AB “participatory methodology” OR AB “digital tools” OR AB “digital participation” OR AB “collaborative research”) AND (AB impact OR AB effectiveness OR AB benefits OR AB empowerment OR AB “learning outcomes” OR AB agency OR AB “community change” OR AB “capacity building”)	A c a d e m i c publications, Peer reviewed papers.

Article Selection Process

The selection process was conducted in several stages. First, duplicates were automatically and manually removed. A calibration exercise was conducted among the two reviewers before the screening phase to ensure consistency in the interpretation and application of the inclusion and exclusion criteria. A random sample of articles (10 %) was independently screened by both reviewers and inter-rater agreement was measured. Discrepancies were discussed and resolved by consensus, and inclusion criteria were refined if necessary.

Following calibration, two independent reviewers screened all titles and abstracts for eligibility using Rayyan®, a web-based tool designed to facilitate article selection in systematic reviews. Articles deemed potentially relevant were retrieved in full text and assessed against the inclusion criteria. All reasons for exclusion at the full-text stage were documented. Any disagreements throughout the process were resolved through discussion, and if necessary, a third reviewer was consulted. The entire process was recorded and presented using a PRISMA 2020 flow diagram.

Data Extraction

A structured data extraction matrix was used to collect standardized information from the included studies. Extracted variables included: author(s), year of publication, country, study objective, type and level of youth participation, age group of participants, digital tools used, methodological design, evaluation approach (criteria and instruments), key findings, and reported limitations.

Quality Assessment

The methodological quality of the included qualitative studies was assessed using the Critical Appraisal Skills Programme (CASP) qualitative checklist. This tool allowed for a structured appraisal of each study's rigor, credibility, and contribution to the field. The evaluation considered whether the research had clearly stated aims and whether the qualitative methodology was appropriate for addressing the research question. It was also examined whether the chosen design, such as case study or ethnography, was aligned with the objectives of the study. The recruitment strategies were assessed in terms of their adequacy and justification, alongside the methods of data collection, which were evaluated for their relevance and capacity to capture the research phenomena.

Particular attention was paid to reflexivity, that is, to the degree to which the relationship between the researcher and participants was considered and whether potential researcher bias was acknowledged. Ethical considerations were reviewed, including whether ethical approval was obtained and whether procedures ensured participants' confidentiality and informed consent. The rigor of the data analysis was scrutinized, especially regarding the clarity and transparency of the analytic process and the strategies used to validate the findings. The clarity of the findings themselves was also evaluated, with emphasis on whether they were well-articulated and supported by evidence from the data. Finally, the overall value of each study was considered, particularly in terms of its contribution to existing knowledge, theoretical frameworks, or practical applications.

Each study was independently assessed by two reviewers using this framework. Any disagreements in their assessments were discussed and resolved by consensus. While no studies were excluded solely based on their CASP rating, the quality appraisal informed the interpretation of findings and the overall strength of the evidence included in the review.

Data Synthesis

A narrative thematic synthesis was carried out to organize and interpret the extracted data. All data were initially screened and filtered using Microsoft Excel, which facilitated the identification of key variables and patterns across studies. The database was then imported into the latest version of RStudio, where qualitative data were analyzed using appropriate R packages designed for textual and thematic analysis. This process enabled systematic coding, categorization, and comparison of the content from the included studies.

Studies were grouped according to key analytical dimensions, including the type of youth participation, the nature of the digital tools employed, and the strategies used to evaluate outcomes. When relevant and feasible, data were visualized through an evidence map, presented in the form of tables or diagrams. In cases where sufficient homogeneity in the data was observed, a qualitative meta-synthesis or descriptive analysis was performed, focusing on frequencies, dominant themes, and the geographical distribution of research efforts.

To examine thematic patterns and geographic trends across the included studies, two complementary analyses were conducted: a keyword frequency analysis and a geographical mapping of study locations.

For the keyword analysis, textual data were extracted from selected descriptive fields in the dataset, including study objectives, main findings, types of digital tools used, methodologies, and modes of child and adolescent participation. Prior to analysis, all textual variables were preprocessed through normalization procedures, including the removal of special characters, lowercasing, whitespace trimming, and transliteration to ASCII format to ensure consistency. The cleaned texts were tokenized, and common English stopwords were removed. A frequency count was then performed to identify the most frequently occurring terms. The results were visualized using a word cloud, where word size was proportional to frequency of occurrence, allowing for a visual representation of dominant themes across the studies.

For the geographical analysis, the country of origin for each study was extracted and aggregated. A choropleth map was generated using R to illustrate the number of studies conducted per country. The intensity of the color represented the relative frequency of studies, with darker shades indicating a greater number of contributions. This approach allowed for the identification of regional patterns in the distribution of research efforts and highlighted underrepresented areas in the existing literature.

All research data, including the extraction matrix and coded categories, were deposited in the Mendeley Data repository and are publicly available under the corresponding DOI: <https://doi.org/10.17632/5yv963dhcs.1> for transparency and reproducibility purposes.

RESULTS

Study Selection Process

The study selection process followed the PRISMA 2020 guidelines and is summarized in the flow diagram above. A total of 1078 records were initially identified through three electronic databases: Scopus ($n = 638$), Web of Science ($n = 294$), and EBSCOhost ($n = 146$). After the removal of 304 duplicate records, 774 records remained for title and abstract screening.

During the screening phase, 715 records were excluded for the following reasons: not original research ($n = 25$), irrelevant study design ($n = 601$), or failure to meet the predefined inclusion criteria ($n = 89$). This process resulted in 59 reports selected for full-text retrieval; however, 11 could not be retrieved.

Of the 48 reports assessed for eligibility in full-text review, 25 were excluded due to lack of relevance to the research topic ($n = 20$) or because they contained incomplete data ($n = 5$). Ultimately, 23 studies met all inclusion criteria and were included in the final review (figure 1).

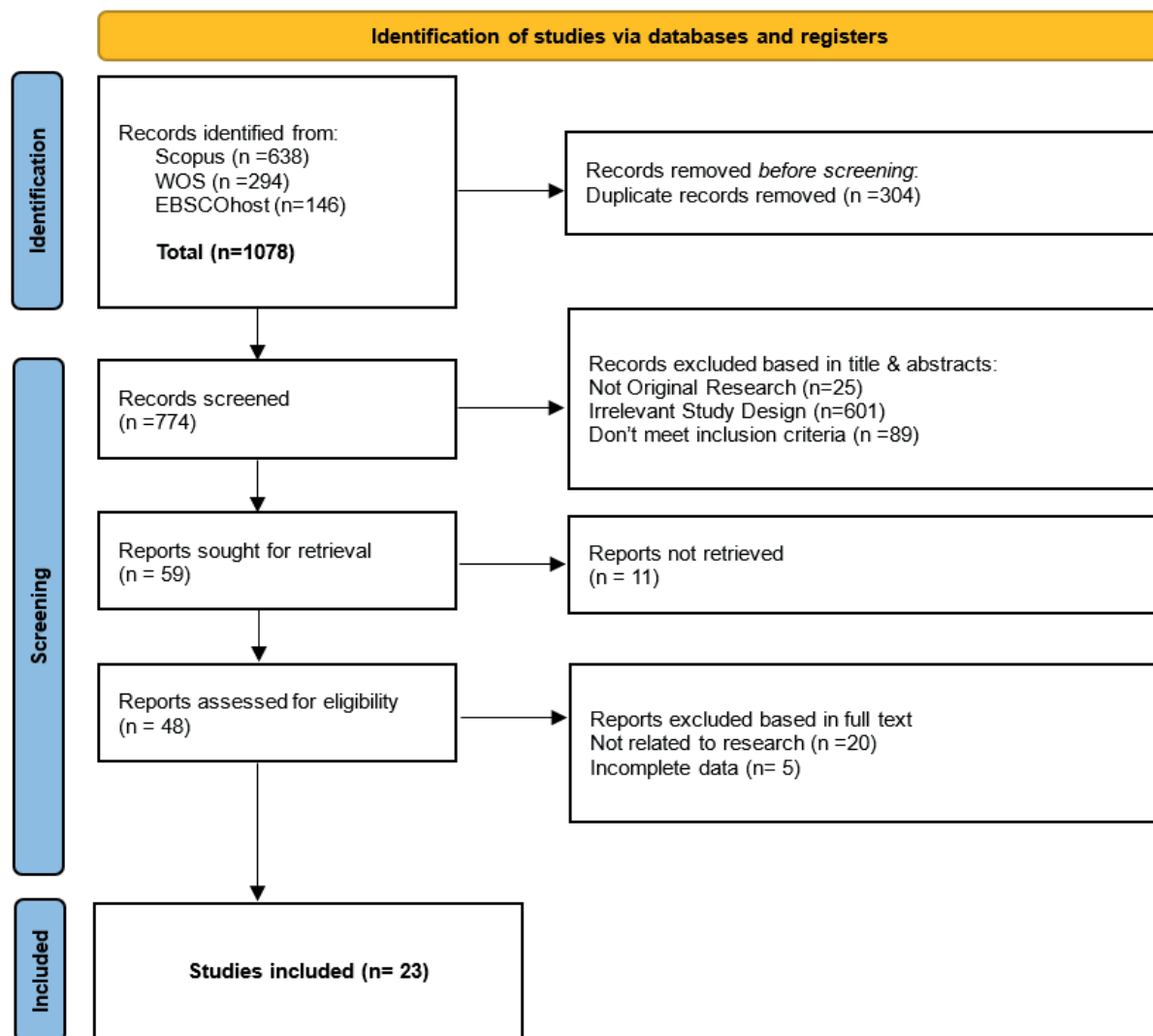


Figure 1. PRISMA Flowchart

Based on the assessment conducted using the CASP tool, the included qualitative studies were generally found to exhibit adequate methodological quality and a low risk of bias. All studies clearly stated their research aims, indicating a well-defined problem formulation that ensured consistency between the study's design and the interpretation of findings.

In total, 22 studies were deemed to have employed an appropriate qualitative methodology, while the remaining four received "moderate" or "partial" ratings, likely due to insufficient justification for the qualitative approach in relation to the research question. Similarly, 21 studies were found to have designs that aligned well with their stated aims, while five showed some minor discrepancies in this alignment.

Regarding the recruitment strategy and data collection methods, most studies provided adequate and coherent descriptions aligned with their research objectives. However, three studies demonstrated limitations

in the clarity or depth of reporting on these aspects, which could affect the credibility of their results.

The least robust domain across the studies was researcher reflexivity, where a significant proportion of studies received “partial” or “moderate” ratings. This suggests that many studies did not explicitly reflect on how the researchers’ positionalities, assumptions, or experiences may have influenced data collection or interpretation posing a potential source of qualitative bias.

Ethical approval and informed consent were clearly reported in most studies, and the data analysis process was evaluated as either appropriate or moderately sound in the vast majority of cases. The presentation of findings was generally clear, and the contribution to the field was rated as high, reflecting the originality, interpretative depth, and relevance of the studies.

In conclusion, the CASP-based appraisal indicated that the qualitative studies reviewed presented an overall low risk of bias, with notable strengths in the clarity of aims, methodological coherence, and transparency in findings. The main limitation was the lack of critical reflexivity, a key element in qualitative research that should be addressed more rigorously in future studies. The full CASP assessment results for each included study are available in the Mendeley Data repository (<https://doi.org/10.17632/5yv963dhcs.1>).

Qualitative Dimensions of Youth & Childhood Co-Researcher Involvement

The following section presents a qualitative synthesis of the most relevant dimensions analyzed across the included studies. A detailed breakdown of these findings is provided in Table 2, which enhances clarity and facilitates comparative interpretation.

Study Objectives

Across the reviewed studies, a common objective was to integrate youth as active agents in research processes that address community challenges and promote social transformation. For instance, Abraczinskas⁽²¹⁾ focused on incorporating Youth Participatory Action Research (YPAR) into aftercare settings to promote physical activity equity, while Koudelka⁽³⁰⁾ and Tintiangco et al.⁽⁸⁾ aimed to foster civic identity and racial justice awareness through participatory research on bullying and identity, respectively. Garcia et al.⁽²⁵⁾ and Thompson et al.⁽³⁷⁾ directed their research toward improving school climates through youth-led evaluations and policy recommendations. Meanwhile, Chinapaw et al.⁽⁹⁾ and Halliday et al.⁽²⁶⁾ emphasized sustainable intervention design and the evaluation of mental health services through youth involvement. These objectives reflect a broad trend toward empowering youth in contexts traditionally governed by adult perspectives.

Type of Child/Adolescent Participation

Most studies demonstrated deep engagement of youth as co-researchers across various stages of the research process. In Chen et al.⁽¹⁰⁾, girls aged 10-15 were trained to conduct interviews and photovoice to evaluate youth development environments. Similarly, Darling-Aduana et al.⁽²³⁾ engaged undergraduate students in the co-redesign of digital citizenship curricula, and Mooney et al.⁽³²⁾ trained young Indigenous Australians to conduct interviews and disseminate findings on health issues. Teixeira⁽¹¹⁾ involved youth in participatory photo mapping and advocacy related to housing abandonment. In contrast, Magnusson et al.⁽³¹⁾, while participatory in intent, involved children and parents more as participants rather than co-researchers, which limited their direct influence over the research process. Petersen et al.⁽³⁶⁾ also exemplified this distinction, as youth were the subject of research while community elders served as the primary agents.

Digital Tools Used

Digital technologies served both functional and expressive purposes across the studies. Photovoice was notably used in Abraczinskas et al.⁽²¹⁾, Chen et al.⁽¹⁰⁾, and Chinapaw et al.⁽⁹⁾ to capture youth perspectives on environmental barriers. Participatory video in Boni et al.⁽²²⁾ and digital storytelling in Trott⁽³⁸⁾ and Pais et al.⁽³⁵⁾ allowed for the articulation of identity and cultural narratives. Tools such as GIS platforms and Qfield mobile apps were employed in Munyaka et al.⁽³⁴⁾ and Teixeira⁽¹¹⁾ to collect and visualize community data, while collaborative platforms and simulation apps were utilized in Morrison et al.⁽³³⁾ and Darling-Aduana et al.⁽²³⁾ to facilitate co-design and urban exploration. Forrester et al.⁽²⁴⁾ applied design software in mental health interventions. However, studies like Mooney et al.⁽³²⁾ intentionally minimized advanced tools to enhance accessibility in under-resourced Indigenous communities.

Study Design and Methodology

Methodological rigor was evident in the widespread use of participatory action research (PAR) and community-based participatory research (CBPR). Chen et al.⁽¹⁰⁾ followed a four-phase PAR model, while Chinapaw et al.⁽⁹⁾ embedded participatory design within a realist evaluation framework across international sites. Halliday et al.⁽²⁶⁾ used a youth-led evaluation model including interviews and co-authored reports. Hickey et al.⁽²⁸⁾ documented a case study using monthly reflection cycles to mentor Indigenous youth in health research. Kaluzeviciute et al.⁽²⁹⁾

and Garcia et al.⁽²⁵⁾ employed school-based PAR to evaluate mental health and school climate, respectively. Other models, like Forrester et al.⁽²⁴⁾ and Darling-Aduana et al.⁽²³⁾, used embedded mixed-method designs, combining surveys, design cycles, and qualitative reflections. The methodological flexibility across contexts demonstrates the adaptability of participatory approaches to different youth populations and thematic foci.

Outcome Assessment

Youth empowerment and shifts in agency were assessed through a mix of qualitative and quantitative indicators. Abraczinskas et al.⁽²¹⁾ and Chinapaw et al.⁽⁹⁾ used pre- and post-surveys measuring empowerment, supported by qualitative triangulation. Boni et al.⁽²²⁾ and Tintiangco et al.⁽⁸⁾ captured voice, awareness, and identity through reflective writings and video narratives. Forrester et al.⁽²⁴⁾ evaluated engagement and usability through iterative focus groups, while Halliday et al.⁽²⁶⁾ used thematic alignment between youth and professionals as a proxy for evaluation quality. Mooney et al.⁽³²⁾ and Koudelka⁽³⁰⁾ emphasized skill development and peer engagement, assessed through interviews, reflections, and observations. The diversity in assessment methods underscores the importance of aligning evaluation strategies with both youth perspectives and the specific goals of each project.

Main Findings

A consistent finding was the transformative effect of participatory methodologies on youth empowerment. Tintiangco et al.⁽⁸⁾ and Trott⁽³⁸⁾ highlighted how digital storytelling and YPAR strengthened cultural identity and intergenerational dialogue. Koudelka⁽³⁰⁾ and Chen et al.⁽¹⁰⁾ demonstrated enhanced critical thinking, leadership, and evaluation skills. Garcia et al.⁽²⁵⁾ and Thompson et al.⁽³⁷⁾ reported tangible policy changes resulting from youth advocacy efforts. Darling-Aduana et al.⁽²³⁾ and Morrison et al.⁽³³⁾ found that digital co-design supported reflective learning and culturally sustaining pedagogies. Projects like Pais et al.⁽³⁵⁾ and Zoellner et al.⁽³⁹⁾ linked youth participation to improved health literacy and community nutrition, respectively. These outcomes confirm that when youth are authentically engaged, their contributions can yield both personal growth and systemic impact.

Global Mapping of Study Locations

The geographical distribution of the included studies, visualized through a choropleth world map, demonstrated a marked concentration of research in high-income, predominantly English-speaking countries. The United States ($n=11$) accounted for the largest number of studies, followed by Canada ($n=2$), the United Kingdom ($n=2$), Australia ($n=2$), and South Africa ($n=2$). Additional contributions were noted from several European and African countries.

Morrison et al.⁽³³⁾ and Chinapaw et al.⁽⁹⁾ had a multicenter representation of Norway & South Africa and Denmark, Netherlands, Nigeria & South Africa, respectively.

Notably, no studies from Latin America were identified that met the inclusion criteria for this review. This absence indicates a significant regional gap in the literature concerning participatory research involving children and adolescents using digital tools. The lack of representation from Latin American countries highlights the need for greater investment in and visibility of research in this area across the region, particularly given its cultural and socio-political diversity, which could offer valuable perspectives to the global discourse (figure 2)

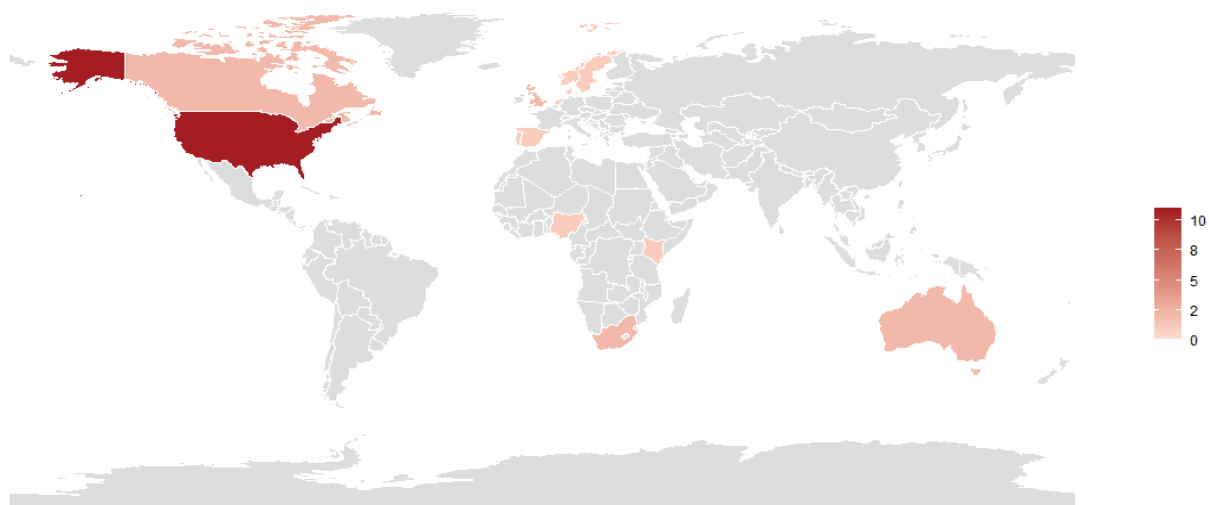


Figure 2. Geographic distribution of included studies on participatory research with children and adolescents using digital tools

Limitations

Table 2. Summary of Key Qualitative Dimensions Across Studies Involving Youth as Co-Researchers

#	Author	Study objective	Type of child/adolescent participation	Age group	Digital tools used	Study design and methodology (1 sentence)	Outcome assessment (instruments, criteria)	Main findings	Limitations
1	Abraczinskas et al. ⁽²¹⁾	To assess the feasibility and impact of integrating Youth Participatory Action Research (YPAR) into aftercare settings and physical activity (PA) interventions to reduce PA access inequities.	Youth served as co-researchers in YPAR, conducting photovoice and analysis of social/environmental barriers.	Middle school students (approx. 11-14 years old).	Photovoice and adapted online YPAR modules.	Concurrent mixed-method triangulation measures combining qualitative journals, interviews, and pre-post empowerment surveys.	Quantitative empowerment measures (sociopolitical, behavioral, perceived control) and qualitative alignment.	YPAR increased youth empowerment and led to all proposed changes being implemented, improving physical activity equity.	Limited generalizability; focus on one regional demographic; potential scalability issues.
2	Boni et al. ⁽²²⁾	To assess how a participatory video (PV) process contributes to expanding youth capabilities and agency from a capabilities approach framework.	Active engagement as co-researchers through participatory action research and video production.	16 to 24 years old.	Participatory video technology.	Participatory action research involving collective video production across diagnosis, planning, production, editing, and dissemination phases.	Qualitative analysis of changes in awareness, voice, and agency based on reflection and observation.	The PV process enhanced awareness and voice, though contextual limitations hindered the expansion of agency.	Structural constraints limited participants' ability to achieve sustained agency beyond the project scope.
3	Chen et al. ⁽¹⁰⁾	To evaluate participatory action research (PAR) as a tool for involving girls in evaluating and improving Girls Inc. youth development environments.	Girls (ages 10-15) acted as co-researchers in participatory evaluation using interviews and photovoice.	10 to 15 years old.	Digital photography, PowerPoint for presenting results.	Multi-site PAR with structured four-phase design: training, data collection, analysis, and public dissemination.	Collaborative thematic coding, presentation outputs, and qualitative reflections from youth participants.	Youth gained evaluation and leadership skills; participatory evaluation led to actionable feedback for program improvement.	Varied implementation across sites; resource constraints for broader adoption.
4	Chinapaw et al. ⁽⁹⁾	To implement and evaluate youth-centred participatory action research (YoPA) to co-create and sustain health-promoting environmental interventions.	Adolescents acted as co-researchers in co-creation groups, participating in research design, data collection, and action planning.	12 to 19 years old.	Photovoice, environmental scans, participatory mapping, and sensor-based behavioral tracking.	Participatory mixed-method comparative design embedded in a realist evaluation framework across four international settings.	Quantitative and qualitative evaluations of intervention effects and co-researcher empowerment using the SUPER-AIM framework.	The co-researcher model supported youth empowerment, tailored interventions to local contexts, and fostered sustained participation.	Ongoing project; final results pending; varied contextual adaptability across countries.

5	Darling-Aduana et al. ⁽²³⁾	To examine the potential of online Youth Participatory Action Research (YPAR) in redesigning digital citizenship curriculum to be culturally sustaining.	Undergraduate students functioned as co-researchers in evaluating and redesigning asynchronous online lessons.	University students (Black-identifying, undergraduates).	Online learning platforms, collaborative design tools, and digital surveys.	Embedded mixed-method design including pre/post surveys, reflections, and participatory course redesign projects.	Qualitative reflections, collaborative artifacts, and student-driven redesign proposals.	YPAR fostered critical consciousness, student engagement, and development of culturally sustaining pedagogy in online environments.	Small sample size; non-generalizable due to context-specific university setting.
6	Forrester et al. ⁽²⁴⁾	To examine how youth-driven participatory design can enhance technological interventions addressing adolescent mental health.	Adolescents co-designed and tested digital mental health tools, contributing to ideation, prototyping, and evaluation.	13 to 18 years old	Mental health apps, online collaborative design platforms, digital surveys	Participatory design study using workshops, iterative prototyping, and user feedback sessions conducted with youth participants.	Surveys on usability, focus group discussions, iterative design feedback loops, and self-reported engagement.	Youth contributed unique insights into app usability and mental health needs; participatory design increased relevance and engagement.	Small sample size; findings specific to U.S. adolescent mental health context; limited longitudinal data.
7	Garcia et al. ⁽²⁵⁾	To explore the role of Latino youth as co-researchers in assessing and transforming school climate through participatory action research.	Latino high school students acted as co-researchers conducting interviews, analysis, and presenting findings to school authorities.	High school students (approximately 15-18 years old)	Digital recorders, presentation software, online survey tools	Youth-led PAR study involving qualitative data collection, thematic analysis, and community engagement presentations.	Reflections, participant interviews, community presentations, school engagement indicators.	Youth successfully identified issues in school climate and proposed actionable changes, enhancing civic identity and efficacy.	Context-specific findings; limited generalizability; digital tools used mainly for documentation and dissemination.
8	Halliday et al. ⁽²⁶⁾	To engage youth as co-researchers in evaluating the accessibility and effectiveness of mental health services.	Young people participated as co-researchers in all stages, including design, interviews, and dissemination.	14 to 24 years old	Online survey platforms, digital communication tools for interviews and collaboration	Participatory evaluation using youth-led interviews, focus groups, and co-authorship in reporting results.	User feedback surveys, analysis of thematic alignment between youth and professionals, joint recommendations.	Youth perspectives enriched the understanding of service gaps and increased youth confidence in research roles.	Limited scale; not all youth co-researchers participated across all phases; digital tools limited to support roles.
9	Halsall et al. ⁽²⁷⁾	To explore how youth peer support services function and why they may be effective for young people with complex mental health and substance use challenges.	One youth peer supporter acted as a co-researcher involved in co-design, data collection, interpretation, and authorship.	14 to 26 years old	Qualtrics survey platform, Menti meter feedback tools	Hybrid realist-participatory mixed-method design including semi-structured interviews, focus groups, and surveys with both youth and staff.	Qualitative CMOC analysis; quantitative surveys assessing self-efficacy, life satisfaction, mental health, and therapeutic alliance.	Four core mechanisms were identified: identity development, social connections, observational learning, and empowerment through autonomy.	Limited generalizability; only one peer formally involved in research co-design; potential bias due to embedded roles of peer staff.

10	Hickey et al. ⁽²⁸⁾	To describe the experience of using Participatory Action Research (PAR) to mentor Indigenous youth as novice researchers in midwifery settings.	Two young Indigenous women were trained and mentored as research assistants to co-lead interviews and assessments.	Youth (exact ages not specified, but indicated as young Indigenous women)	Bayley Scales of Infant Development (Bayley III), audio recorders	Case study using PAR approach involving monthly team reflection, observational learning, and mentoring in research and clinical practices.	Reflective accounts, research assistant narratives, field notes; infant developmental assessments with Bayley III.	Mentoring novice Indigenous researchers through PAR built capacity and interest in midwifery and health careers.	Short-term observation; limited external transferability; did not include direct digital analysis by youth themselves.
11	Kaluzeviciute et al. ⁽²⁹⁾	To evaluate the use of participatory action research (PAR) to improve school culture and student mental health.	Students were co-researchers in school-based PAR groups involved in diagnosing culture, implementing changes, and evaluating results.	Secondary school students (approximately 12-18 years old)	Survey tools, online documentation platforms, possibly video/observation recordings (not specified in detail)	Longitudinal qualitative study including pre- and post-interviews, focus groups, observations, and documentation review across multiple schools.	Thematic framework analysis of interviews and group reports; observational data on school change and student engagement.	PAR empowered students to shape school culture and mental health policy; enabled reflective cycles of change.	Feasibility still being tested; detailed outcome metrics pending in full longitudinal analysis.
12	Koudelka ⁽³⁰⁾	To examine how Youth Participatory Action Research (YPAR) fosters civic identity, agency, and social justice engagement in rural adolescent students.	Students acted as researchers, selecting topics, designing surveys, and conducting analysis on bullying in their school.	High school students (14-17 years old)	Surveys, collaborative documents, video recording tools	Two-phase qualitative study using critical discourse analysis, participatory projects, and student-led reflection.	Student surveys, reflective essays, observation of engagement and group decision-making.	Students developed agency, leadership, and critical thinking skills through authentic participation in civic research.	Small rural sample; limited generalizability; not all students completed the full cycle of participation.
13	Magnusson et al. ⁽³¹⁾	To implement a CBPR-based health intervention promoting healthy weight and equity in children through school and community programs.	Children and parents engaged in co-design and participatory evaluation of interventions, though not formal co-researchers.	6 to 12 years old	C A N T A B touchscreen cognitive tests, electronic surveys, document analysis software	Quasi-experimental CBPR intervention with repeated cross-sectional and longitudinal design supported by health economic evaluation.	BMI measures, cognitive performance (C A N T A B), qualitative focus groups and school-based observations.	Health intervention linked to improved self-efficacy and community ownership in disadvantaged areas; CBPR fostered trust and engagement.	Children were participants, not co-researchers; limited generalizability; long-term outcomes still under analysis.
14	Mooney et al. ⁽³²⁾	To demonstrate the application of community-based participatory research (CBPR) in working with young Indigenous Australians to explore resilience in relation to bloodborne viruses and sexually transmissible infections.	Young Indigenous people acted as peer researchers, contributing to the development of research tools, conducting interviews, and participating in data analysis and dissemination.	Youth (exact age not specified, but clearly adolescents and young adults)	Digital recorders, qualitative interview tools; no advanced software used to ensure accessibility	Multi-site qualitative CBPR design with peer researchers trained in interview techniques, data collection, and community dissemination, adapted to local contexts and priorities.	Thematic qualitative analysis, reflection by peer researchers, number and depth of interviews conducted, community engagement levels.	CBPR enabled skill development and cultural relevance, empowering youth researchers and improving local STI and BBV education strategies.	Lack of uniformity across sites; limited digital infrastructure; outcomes still in development at the time of reporting.

15	Morrison al. ⁽³³⁾	et	To investigate how young people develop agency through urban learning experiences supported by digital tools across diverse city contexts.	Students participated in co-designed educational projects using digital tools to explore and influence urban environments and planning.	14 to 22 years old	Mobile media, situated simulation apps, digital photography, design fiction platforms	Three-case qualitative study using ethnography, participatory action research, and experimental digital pedagogy in urban learning environments.	Fieldnotes, interviews, digital artifacts, learning diaries, participatory mapping and design outcomes.	Digital tools supported reflective urban learning, identity development, and participatory city planning among youth.	Differing contexts and tools across cases; results not generalizable; limited post-intervention tracking.
16	Munyaka al. ⁽³⁴⁾	et	To assess rural mobility needs and barriers using a participatory GIS (PGIS) framework involving local youth and community stakeholders.	Local youth with GIS training participated in the data collection process as co-researchers, working with community elders and technicians.	Youth (specific age not provided, but described as trained young local participants)	Participatory GIS software, GPS tools, Qfield mobile data collection, OpenStreetMap	Participatory multi-level PGIS framework combining context analysis, mobile data collection, mapping, and stakeholder validation.	Mapping accuracy, validation meetings with stakeholders, completeness of spatial layers, usability of maps.	Youth engagement in PGIS fostered accurate mobility data, improved local infrastructure planning, and supported inclusive transport policy discussions.	Focused only on three sub-locations; dependent on external technical support; no long-term impact evaluation.
17	Pais et al. ⁽³⁵⁾		To explore how formal and non-formal community settings can promote health literacy in children and adolescents through participatory approaches.	Children and adolescents participated in community profiling and collaborative research projects to explore health issues and rights.	8 to 24 years old	Digital storytelling, community mapping tools, survey platforms (not specified in brand)	Two mixed-methods studies using focus groups, questionnaires, and participatory profiling in schools and associations.	Well-being scales, empowerment indices, interviews, and case study documentation.	Collaborative health research increased youth awareness of health rights and agency; associations provided empowering support environments.	Small focus group sizes; non-random samples; possible selection bias.
18	Petersen al. ⁽³⁶⁾	et	To address elevated blood lead levels among Native American children through a community-based participatory research and policy-change initiative.	Youth were the focus population; Clan Mothers and Fathers served as trained lay health advisors conducting education, outreach, and advocacy.	Children under 6 (participants); youth and adults as community agents	Digital presentations, local media campaigns, email advocacy tools	CBPR project using a lay health advisor model supported by a multi-sector advisory board to implement and evaluate local policy and education changes.	Policy enactment, blood screening rates, community engagement metrics, narrative case reports.	The project led to successful policy changes for lead testing and reduced exposure risk through advocacy and tribal engagement.	Limited youth co-researcher roles; broader systemic issues beyond the project scope remained unaddressed.
19	Teixeira ⁽¹¹⁾		To explore youth perspectives on housing abandonment and its effects on individual and community well-being.	Youth as co-researchers using participatory photo mapping and advocacy.	14 to 19 years old	Digital cameras, GIS software, ArcGIS, digital maps	Mixed methods CBPR combining participatory photo mapping, in-depth interviews, and spatial GIS analysis.	Triangulation of qualitative codes, maps, and community presentations.	Youth identified abandonment as symbolic of neglect, affecting safety, fear, and agency; developed a youth-defined version of broken windows theory.	Limited generalizability; small sample size; no long-term tracking.

20	Thompson et al. ⁽³⁷⁾	To examine the impact of a Youth Participatory Action Research (YPAR) project on addressing racial inequities in a rural school over a two-year period.	High school students acted as co-researchers, policy analysts, and peer educators.	High school students (ages not specified)	Online surveys, presentation software, digital documentation platforms	Qualitative case study including student focus group, interviews with students and staff, and documentation review.	Interviews, thematic coding, staff and peer feedback on student-led workshops.	Students gained leadership and visibility; their recommendations influenced school policies and adult perceptions of equity.	Partial adult resistance; challenges sustaining institutional change over time.
21	Tintiangco et al. ⁽⁸⁾	To document and reflect on the use of Youth Participatory Action Research (YPAR) in empowering Filipino-American high school students to interrogate issues of race, education, and identity.	High school students acted as co-researchers designing and conducting research projects on identity and social justice.	Adolescents aged 15-18	Presentation software, social media platforms for dissemination	Case study approach documenting a YPAR summer program combining curriculum, research, and community engagement.	Reflective writings, student presentations, group discussions	YPAR empowered students to articulate identity, engage in critical thinking, and develop leadership through culturally relevant inquiry.	Context-specific; limited scalability beyond the program; lack of formal outcome metrics.
22	Trott ⁽³⁸⁾	To explore how digital storytelling supports Indigenous youth in expressing cultural identity and addressing community issues.	Youth acted as digital storytellers and creators of community-engaged media projects.	Indigenous youth aged 14-20	Digital storytelling software, video cameras, editing tools	Arts-based participatory research through digital media production and cultural exchange workshops.	Qualitative analysis of digital stories and participant reflections	Digital storytelling strengthened cultural identity, peer connection, and intergenerational dialogue among youth.	Small-scale; challenges in sustaining long-term community impact.
23	Zoellner et al. ⁽³⁹⁾	To examine the feasibility and perceptions surrounding community gardens in a health disparate region using CBPR.	Youth and parents participated in surveys; youth expressed willingness to work in gardens and consume garden-grown food.	Children aged 5-13 and parents of enrolled summer camp students	Quantitative surveys, participatory planning using GIS and digital design of gardens	Mixed methods study with CBPR approach including qualitative key informant interviews and quantitative surveys with youth and parents.	Survey scales for attitudes, beliefs, self-efficacy, and willingness to try fruits and vegetables	Community gardens were perceived to improve community cohesion and nutrition; high willingness to participate among youth.	Pilot nature; small sample for qualitative phase; regional specificity.

While the participatory designs were innovative, limitations were frequently noted. Studies like Halsall et al.⁽²⁷⁾ and Forrester et al.⁽²⁴⁾ cited small sample sizes and limited generalizability. Others, such as Kaluzeviciute et al.⁽²⁹⁾ and Munyaka et al.⁽³⁴⁾, acknowledged that full longitudinal effects were pending or difficult to evaluate. Resource and scalability issues were reported in Abraczinskas et al.⁽²¹⁾ and Chen et al.⁽¹⁰⁾, while Magnusson et al.⁽³¹⁾ and Petersen et al.⁽³⁶⁾ noted the challenge of involving youth as full co-researchers. Technological access was a constraint in Mooney et al.⁽³²⁾ and Teixeira⁽¹¹⁾, and contextual specificity limited broader application in Trott⁽³⁸⁾ and Darling-Aduana et al.⁽²³⁾. These constraints reveal the importance of contextual adaptation, sustained funding, and inclusive infrastructures to support the scalability and durability of participatory youth research.

Children and Adolescents Participation in the Included Studies

The analysis of word frequency within the “Main findings” sections of the included studies revealed a strong thematic focus on youth and health. As depicted in the bar chart, the term “youth” appeared most frequently, emphasizing the centrality of adolescents and young participants in the reported outcomes. This aligns with the participatory orientation of the studies, which often framed youth not only as subjects but as active agents in research processes. The second most frequent term, “health”, indicates that many of the studies were situated within health-related contexts, including physical, mental, and community well-being. These results complement the broader keyword analysis represented in the word cloud, where terms such as “participatori”, “qualit”, and “research” also appeared prominently. Together, these findings suggest that participatory research with children and adolescents has been predominantly applied in health-focused domains, with a strong qualitative and engagement-driven emphasis.

The analysis of the type of participation of children and adolescents in the reviewed studies revealed that the majority of studies ($n = 15$) explicitly reported active involvement of young participants in the research process. This active participation included activities such as co-designing tools, contributing to data collection, or participating in the interpretation of results.

In contrast, 8 studies did not clearly specify the nature or extent of youth participation. These cases were classified as “Not specified” due to the lack of explicit statements or details regarding how children and adolescents were involved beyond their role as study subjects.

These findings underscore the growing recognition of children and adolescents as active contributors in research; however, they also highlight inconsistencies in reporting practices, which may hinder efforts to assess the quality and depth of participatory engagement across studies (figure 3).

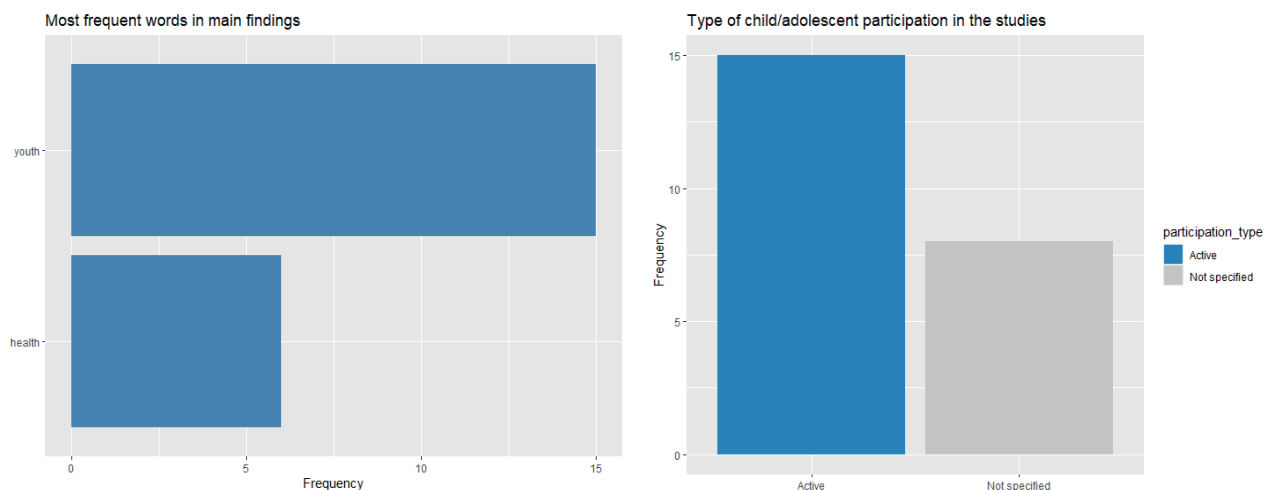


Figure 3. Most frequent keywords in the main findings of the included studies

DISCUSSION

This systematic review provided comprehensive insights into the empirical landscape of participatory research involving children and adolescents as co-researchers in projects utilizing digital tools. The analysis revealed a consistent trend toward recognizing youth not merely as participants but as active agents in the research process, contributing meaningfully to the design, implementation, and evaluation of interventions. This trend responds not only to a methodological innovation but also to an urgent need to democratize knowledge production in public health. As Debenham et al.⁽⁴⁰⁾ note, collaborations between youth and experts in co-designing digital public health tools have increased cultural relevance and intervention effectiveness, particularly in mental health and substance use contexts. Digital participatory research, therefore, not only

improves data quality but also fosters more sustainable and context-responsive solutions—especially for underrepresented populations. One of the most salient findings was the transformative impact of participatory methodologies on youth empowerment, critical thinking, and civic engagement, as evidenced across diverse thematic areas such as mental health, digital citizenship, educational equity, and public health.

Furthermore, the review documented a wide array of innovative digital tools from photovoice and participatory GIS to digital storytelling and design platforms that were successfully employed to foster engagement and amplify youth voices. A particularly novel contribution of this study lies in its synthesis of outcome assessment strategies, which demonstrated a methodological evolution toward triangulated and youth-centered evaluation frameworks. In addition, the study addressed a significant geographic gap by identifying the lack of representation from Latin American contexts, thereby providing a foundational call for more inclusive and regionally diverse participatory research efforts. By systematically mapping the methods, impacts, and challenges of these participatory experiences, this review advanced the understanding of how digital tools can be harnessed to enhance cooperative research with young populations, offering valuable guidance for scholars, educators, and policymakers committed to youth-centered inquiry in the digital era. Beyond its social and methodological contributions, the findings of this review also underscore the pedagogical potential of participatory research.

When integrated within educational settings, these methodologies offer a powerful means to foster early development of investigative competencies in children and adolescents. Through their engagement as co-researchers, students acquire and practice key skills such as formulating questions, analyzing data, and collaboratively constructing knowledge skills that are aligned with contemporary educational goals for scientific literacy and active citizenship. This reinforces the idea that participatory research is not only a tool for inclusion, but also a formative educational experience that can enrich school curricula and contribute to student engagement and motivation.

Importance of Participation in Research

The participation of children and adolescents in research is crucial for several reasons. First, it ensures that the perspectives and needs of young people are directly incorporated into the development of interventions, making them more relevant and effective.^(41,42) Studies such as those by Garcia et al.⁽²⁵⁾ Chinapaw et al.⁽⁹⁾ and Thompson et al.⁽³⁷⁾ strongly aligned with this view, demonstrating that youth involvement resulted in the development of more contextually relevant and impactful initiatives. These cases offered clear evidence that participatory methodologies can yield interventions with direct relevance to the lived realities of young people, resonating with the developmental processes described in tools like YounGo and Asszerteen.⁽⁴¹⁾

Moreover, this review found that participatory research processes were effective in fostering empowerment, ownership, and leadership among youth, a claim also supported in previous studies.^(43,44) Consistent with this, Chen et al.⁽¹⁰⁾ Koudelka et al.⁽³⁰⁾ and Tintiangco et al.⁽⁸⁾ reported gains in youth self-efficacy, civic engagement, and identity formation through participatory action research. These findings converged with Ludlow et al.⁽⁴⁴⁾ outcomes, where young people helped co-design a mental health platform that was perceived as both acceptable and engaging.⁽⁴⁴⁾ However, studies like Petersen et al.⁽³⁶⁾ and Magnusson et al.⁽³¹⁾ illustrated divergent models where children were primarily participants rather than co-researchers, thus limiting their agency in shaping the outcomes.

In terms of ethical and methodological rigor, involving youth as co-researchers was shown to enhance inclusivity and responsiveness.^(45,46) Halliday et al.⁽²⁶⁾ Forrester et al.⁽²⁴⁾ and Pais et al.⁽³⁵⁾ exemplified how participatory roles helped overcome ethical tensions and increased the cultural relevance of both process and outputs. Still, as revealed in the CASP-based appraisal, several studies, including Forrester et al.⁽²⁴⁾ and Halsall et al.⁽²⁷⁾ demonstrated weaknesses in researcher reflexivity, indicating a persistent gap between participatory ideals and their full implementation.

Methods and Tools for Cooperative Research

This review identified diverse participatory methodologies, with co-design workshops and participatory design (PD) emerging as particularly impactful strategies. These findings supported the conclusions of previous literature that such approaches are instrumental in tailoring interventions to youth needs.^(43,47) Darling-Aduana et al.⁽²³⁾ and Morrison et al.⁽³³⁾ for instance, implemented co-design frameworks that empowered students to revise digital curricula and engage with urban planning simulations, respectively. Their experiences mirrored the design processes behind Safe and Well CRC and YounGo, confirming that PD can lead to culturally sustaining and functionally effective outcomes.⁽⁴⁷⁾

A notable convergence with earlier research^(41,48) was the emphasis on integrating digital tools photovoice, participatory video, GIS, and online platforms as both expressive and analytical instruments. Chinapaw et al.⁽⁹⁾ Trott et al.⁽³⁸⁾ and Teixeira et al.⁽¹¹⁾ illustrated how youth used these tools not just to document experiences, but also to analyze, map, and advocate for change in their communities. In contrast, Mooney et al.⁽³²⁾ deliberately

minimized the use of advanced technology to ensure accessibility in Indigenous contexts, highlighting a strategic divergence aligned with equity and feasibility in under-resourced settings.

Gamification and play-based engagement methods were not frequently reported across the included studies, suggesting a gap between their theoretical appeal⁽⁴⁸⁾ and their practical application. None of the studies in this review employed full-scale game-based participatory models, which diverges from approaches trialed in Scandinavian co-design settings.

Impact of Cooperative Research

The findings of this review underscored the transformative potential of participatory research, particularly in health-related domains. Youth involvement led to outcomes that were not only more relevant and acceptable but also more sustainable in terms of implementation and uptake, aligning with previous studies on digital mental health interventions.^(44,49) For example, the work of Boni *et al.*⁽²²⁾ Zoellner *et al.*⁽³⁹⁾ and Garcia *et al.*⁽²⁵⁾ demonstrated how participatory efforts enhanced health literacy, agency, and nutrition awareness in marginalized populations. This improvement in health literacy is particularly relevant in a digitized world, where accessing and critically understanding health information is a key life skill. Recent studies have shown that digital participatory methodologies promote critical health thinking, foster positive attitudes toward self-care, and enhance youth motivation to adopt healthy.^(43,44) When youth lead these strategies, they also reduce communication barriers with health professionals and promote more equitable researcher-participant relationships.

Importantly, several studies such as Trott *et al.*⁽³⁸⁾ and Tintiangco *et al.*⁽⁸⁾ confirmed that youth participation strengthened cultural identity and intergenerational dialogue an impact dimension underrepresented in prior literature. Conversely, Magnusson *et al.*⁽³¹⁾ and Petersen *et al.*⁽³⁶⁾ revealed more limited impact, where structural constraints and limited youth agency restricted the transformative potential of the interventions, suggesting that inclusion alone does not guarantee empowerment unless accompanied by meaningful decision-making power. Moreover, findings from recent international literature converge on the multidimensional benefits of involving children and adolescents as co-researchers. According to Bakhtiar *et al.*⁽⁷⁾ such participation is associated with enhanced self-confidence, subjective well-being, sense of agency, self-efficacy, and self-esteem in young people. From an educational standpoint, youth involvement in co-research fosters a deeper understanding of subject matter, the development of independent viewpoints, public speaking skills, ethical reasoning, and critical thinking.^(12,50,51,52,53) These outcomes reaffirm the value of participatory research as a pedagogical strategy, capable of strengthening engagement and stimulating cognitive and emotional development within school contexts. In addition to individual gains, co-investigation with children and adolescents has demonstrated positive social effects. International studies have shown increased collaboration, leadership, community contribution, civic commitment, inclusion, and help-seeking behavior among youth involved in participatory research.^(50,54,55)

The sense of belonging and willingness to share knowledge, often cultivated in these experiences, aligns with broader goals of democratic education and inclusive learning environments. These findings support the implementation of participatory research as not only a means of producing knowledge, but also of promoting social integration and participatory citizenship from early developmental stages. Despite these promising outcomes, the literature also highlights a methodological gap. As noted by Anyon *et al.*⁽⁵⁶⁾ most studies assessing the impact of co-research rely on qualitative designs. There is a pressing need to incorporate mixed methods and experimental approaches that allow for more robust measurement of effects, particularly in educational and psychosocial variables. By advancing empirical evidence on the outcomes of co-research, especially in low and middle income countries such as those in Latin America, future research can more effectively inform policy and pedagogical innovation grounded in participatory principles.

In the same way, the contribution of youth-led research to policy development was evident in Thompson *et al.*⁽³⁷⁾ where participatory action research resulted in institutional changes in school policy. This resonates with broader claims about the role of youth in shaping equitable and inclusive programs.^(40,41) However, Darling-Aduana *et al.*⁽²³⁾ highlighted challenges in sustaining institutional change, reflecting the difficulties in translating participatory insights into long-term systemic reforms.

Future Directions

The future of cooperative research involving children and adolescents through digital tools is highly promising. As technological advancements accelerate, new and engaging methods are emerging that can meaningfully involve young people across all phases of the research process. Among these, artificial intelligence (AI) and machine learning (ML) offer innovative possibilities for both data collection and analysis, enhancing not only methodological efficiency but also the depth of youth participation.^(57,58)

Notably, AI tools can process large volumes of youth-generated data and help detect emerging health patterns, facilitating the co-creation of personalized well-being indicators. In this regard, Famaye *et al.*⁽⁵⁷⁾

propose involving children and adolescents directly in the co-design of ML algorithms as a way to foster advanced digital competencies and promote ethical stewardship over the use of their data.

However, technological innovation must go hand-in-hand with sustained empirical evaluation. There remains a pressing need to examine the long-term impact of participatory approaches on young people's lives—particularly regarding mental health outcomes, educational trajectories, and overall social well-being. ^(44,49) Addressing this knowledge gap is essential for moving from promising practices to evidence-based models of cooperative research.

Lastly, to ensure the sustainability and real-world impact of these initiatives, stronger collaboration is needed among researchers, policymakers, educators, and community practitioners. Effective knowledge translation depends on institutional commitment to participatory frameworks and on amplifying youth voices throughout the entire research lifecycle. ^(45,46) Only through such integrative and inclusive strategies can participatory digital research evolve into a transformative force for child and adolescent health and development.

Study Limitations

While this review presents a comprehensive synthesis of participatory research involving children and adolescents using digital tools, certain limitations warrant acknowledgment without compromising the study's overall rigor. The geographical concentration of studies in high-income countries reflects broader structural disparities in global research production rather than a flaw in the review's scope. Methodological diversity among included studies ranging from participatory action research to embedded mixed-method designs enriched the analytical depth, even though it precluded meta-analytic synthesis. Variability in reporting the nature and extent of youth participation highlighted the need for more standardized documentation practices across the field. Similarly, the absence of longitudinal data in several studies reflected the emerging and often exploratory nature of participatory designs, rather than methodological weakness. Lastly, the reliance on selected databases and language filters was methodologically consistent with systematic review standards and ensured feasibility, while still capturing a broad and representative body of empirical work.

CONCLUSIONS

This systematic review found that actively engaging children and adolescents as co-researchers through digital tools enhanced the relevance, effectiveness, and sustainability of interventions by integrating youth perspectives throughout the research process. Such participation fostered empowerment, leadership, and critical thinking, particularly in areas such as health, education, and community development, with methods like photovoice, participatory GIS, and digital storytelling serving as effective means for data collection and youth-led interpretation.

However, the review also identified notable limitations, including small sample sizes, insufficient methodological reporting, technological access disparities, a lack of longitudinal evidence, and a clear geographical gap—particularly the absence of studies from Latin America. Future research should pursue more inclusive and scalable participatory models, potentially incorporating emerging technologies such as artificial intelligence, while ensuring that youth-generated insights are effectively translated into policy and practice.

ACKNOWLEDGMENT

This work was made possible through the financial support provided by the ANID / FONDECYT Regular 1250064 project, supported by the Chilean Agency for Research and Development.

BIBLIOGRAPHIC REFERENCES

1. de Toro X, Barros BS, Schwartzman MS, Cordero AR, Lara L. Plataforma Online de Evaluación de Compromiso Escolar, Versión 3.0: avance hacia un sistema de protección de las trayectorias educativas. *European Journal of Education and Psychology*. 2021;14(2):1-29. doi: <https://doi.org/10.32457/ejep.v14i2.1739>.
2. Familia MdDSy. "Por medio de la cual se establece un estatuto de garantía y protección integral de derechos de la niñez y adolescencia". In: Familia MdDSy, editor. Ley 21430. Chile: Diario Oficial de 15 de marzo de 2022: Ministerio de Desarrollo Social y Familia; 2022.
3. Saracostti M, Caro P, Grau MO, Kinkead AP, Vatter N. El derecho de participación en la niñez: alcances y desafíos para la investigación social. *Revista del CLAD Reforma y Democracia*. 2015(62):211-44. <https://repositorio.uc.cl/handle/11534/22719?show=full>
4. Cuevas-Parra P. Co-researching with children in the time of COVID-19: Shifting the narrative on methodologies to generate knowledge. *International Journal of Qualitative Methods*. 2020;19:1609406920982135. doi: <https://doi.org/10.1177/1609406920982135>. v

5. Marinkovic Chavez K, Gibbs L, Saracostti M, Lafaurie A, Campbell R, Sweeney D, et al. Think Big: A multinational collaboration to promote children's role as coresearchers in participatory research. *American Journal of Community Psychology*. 2022;69(3-4):306-17. doi: <https://doi.org/10.1002/ajcp.12582>.
6. Santana AI, Leisewitz AV, Bravo P, Nogueira A. Consideraciones éticas para investigaciones con niños, niñas y adolescentes como coinvestigadores, reflexión desde la experiencia chilena. *Revista Colombiana de Bioética*. 2023;18(2). doi: <https://doi.org/10.18270/rcb.v18i2.4372>.
7. Bakhtiar A, Lang M, Shelley B, West M. Research with and by children: a systematic literature review. *Review of Education*. 2023;11(1):e3384. doi: <https://doi.org/10.1002/rev3.3384>.
8. Tintiangco-Cubales A, Daus-Magbual A, Desai M, Sabac A, Von Torres M. Into our hoods: where critical performance pedagogy births resistance. *International Journal of Qualitative Studies in Education*. 2016;29(10):1308-25. doi: <https://doi.org/10.1080/09518398.2016.1201165>.
9. Chinapaw M, Klaufus L, Oyeyemi A, Draper C, Palmeira A, Silva M, et al. Youth-centred participatory action approach towards co-created implementation of socially and physically activating environmental interventions in Africa and Europe: the YoPA project study protocol. *BMJ OPEN*. 2024;14(2). doi: <https://doi.org/10.1136/bmjopen-2024-084657>.
10. Chen PY, Weiss FL, Nicholson HJ. Girls study girls Inc.: Engaging girls in evaluation through participatory action research. *American Journal of Community Psychology*. 2010;46(1):228-37. doi: <https://doi.org/10.1007/s10464-010-9328-7>.
11. Teixeira S. Beyond Broken Windows: Youth Perspectives on Housing Abandonment and its Impact on Individual and Community Well-Being. *Child Indicators Research*. 2016;9(3):581-607. doi: <https://doi.org/10.1007/s12187-015-9327-1>.
12. Lundy L, McEvoy L. Children's rights and research processes: Assisting children to (in) formed views. *Childhood*. 2012;19(1):129-44. doi: <https://doi.org/10.1177/0907568211409078>.
13. Ozer EJ, Douglas L. The impact of participatory research on urban teens: An experimental evaluation. *American journal of community psychology*. 2013;51(1-2):66-75. doi: <https://doi.org/10.1007/s10464-012-9546-2>.
14. Shier H. Children as researchers in Nicaragua: Children's consultancy to transformative research. *Global Studies of Childhood*. 2015;5(2):206-19. doi: <https://doi.org/10.1177/2043610615587798>.
15. Arias ALS, Ferrandis IG, Hernández LCC. Metodología de análisis de la percepción ambiental de los niños en una comunidad periurbana. *Sophia*. 2020;16(1):19-32. doi: <https://doi.org/10.18634/sophiaj.16v.1i.1004>.
16. Freire K, Pope R, Jeffrey K, Andrews K, Nott M, Bowman T. Engaging with Children and Adolescents: A Systematic Review of Participatory Methods and Approaches in Research Informing the Development of Health Resources and Interventions. *Adolescent Research Review*. 2022;7(3):335-54. doi: <https://doi.org/10.1007/s40894-022-00181-w>.
17. Orlowski SK, Lawn S, Venning A, Winsall M, Jones GM, Wyld K, et al. Participatory Research as One Piece of the Puzzle: A Systematic Review of Consumer Involvement in Design of Technology-Based Youth Mental Health and Well-Being Interventions. *JMIR Human Factors*. 2015;2(2):e12. doi: <https://doi.org/10.2196/humanfactors.4361>.
18. Mallan KM, Parlo S, and Giardina N. The challenges of participatory research with 'tech-savvy' youth. *Journal of Youth Studies*. 2010;13(2):255-72. doi: <https://doi.org/10.1080/13676260903295059>.
19. Tsang VWL, Sarah F, Charles T, and Smith S. A novel way to engage youth in research: evaluation of a participatory health research project by the international children's advisory network youth council. *International Journal of Adolescence and Youth*. 2020;25(1):676-86. doi: <https://doi.org/10.1080/02673843.2020.1716817>.

20. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71. doi: <https://doi.org/10.1136/bmj.n71>.
21. Abraczinskas M, Zarrett N. Youth Participatory Action Research for Health Equity: Increasing Youth Empowerment and Decreasing Physical Activity Access Inequities in Under-resourced Programs and Schools. *American Journal of Community Psychology*. 2020;66(3):232-43. doi: <https://doi.org/10.1002/ajcp.12433>.
22. Boni A, López-Fogués A, Millán G, Belda-Miquel S. Analysing participatory video through the capability approach - A case study in Quart de Poblet (Valencia, Spain). *Action Research*. 2020;18(3):282-301. doi: <https://doi.org/10.1177/1476750317715073>.
23. Darling-Aduana J, Hemingway K. Centering Student Voice to Reimagine Curriculum and Instruction in an Online Citizenship Course. *TechTrends*. 2024;68(6):1066-77. doi: <https://doi.org/10.1007/s11528-024-01001-9>.
24. Forrester JV, Covington Clarkson LM. CULTIVATING MATHEMATICAL PROFICIENCIES AND IDENTITIES THROUGH CULTURALLY AND COMMUNITY INSPIRED ACTIVITIES. *Prometeica*. 2023(27):761-71. doi: <https://doi.org/10.34024/prometeica.2023.27.15375>.
25. Garcia AP, Minkler M, Cardenas Z, Grills C, Porter C. Engaging Homeless Youth in Community-Based Participatory Research: A Case Study From Skid Row, Los Angeles. *Health Promotion Practice*. 2014;15(1):18-27. doi: <https://doi.org/10.1177/1524839912472904>.
26. Halliday AJ, Kern ML, Garrett DK, Turnbull DA. The student voice in well-being: a case study of participatory action research in positive education. *Educational Action Research*. 2019;27(2):173-96. doi: <https://doi.org/10.1080/09650792.2018.1436079>.
27. Halsall T, Daley M, Hawke L, Henderson J, Matheson K. "You can kind of just feel the power behind what someone's saying": a participatory-realist evaluation of peer support for young people coping with complex mental health and substance use challenges. *BMC Health Services Research*. 2022;22(1). doi: <https://doi.org/10.1186/s12913-022-08743-3>.
28. Hickey SD, Maidment S-J, Heinemann KM, Roe YL, Kildea SV. Participatory action research opens doors: Mentoring Indigenous researchers to improve midwifery in urban Australia. *Women and Birth*. 2018;31(4):263-8. doi: <https://doi.org/10.1016/j.wombi.2017.10.011>.
29. Kaluzeviciute G, Jessiman T, Burn A-M, Ford T, Geijer-Simpson E, Kidger J, et al. Participatory Action Research on School Culture and Student Mental Health: A Study Protocol. *International Journal of Qualitative Methods*. 2021;20. doi: <https://doi.org/10.1177/16094069211047753>.
30. Koudelka CM. Tapping Teen Power: (Re)Positioning Students for Civic Action. *Journal of Adolescent and Adult Literacy*. 2021;64(4):389-98. doi: <https://doi.org/10.1002/jaal.1126>.
31. Magnusson M, Hallmyr Lewis M, Smaga-Blom M, Lissner L, Pickering C. Health Equilibrium Initiative: A public health intervention to narrow the health gap and promote a healthy weight in Swedish children. *BMC Public Health*. 2014;14(1). doi: <https://doi.org/10.1186/1471-2458-14-763>.
32. Mooney-Somers J, Maher L. The Indigenous Resiliency Project: a worked example of community-based participatory research. *New South Wales public health bulletin*. 2009;20(7):112-8. doi: <https://doi.org/10.1071/nb09007>.
33. Morrison A, Erstad O, Liestøl G, Pinfold N, Snaddon B, Hemmersam P, et al. Investigating agentive urban learning: an assembly of situated experiences for sustainable futures. *Oxford Review of Education*. 2019;45(2):204-23. doi: <https://doi.org/10.1080/03054985.2018.1556627>.
34. Munyaka J-CB, Chenal J, de Roulet PTH, Mandal AK, Pudasaini U, Otieno NO. Multi-Level Participatory GIS Framework to Assess Mobility Needs and Transport Barriers in Rural Areas: A Case Study of Rural Mumias East, a Sub-County of Kakamega, Kenya. *Sustainability (Switzerland)*. 2023;15(12). doi: <https://doi.org/10.3390/su15129344>.

35. Pais SC, Rodrigues M, Menezes I. Community as locus for health formal and non-formal education: The significance of ecological and collaborative research for promoting health literacy. *Frontiers in Public Health*. 2014;2. doi: <https://doi.org/10.3389/fpubh.2014.00283>.
36. Petersen DM, Minkler M, Vásquez VB, Kegler MC, Malcoe LH, Whitecrow S. Using community-based participatory research to shape policy and prevent lead exposure among Native American children. *Progress in community health partnerships : research, education, and action*. 2007;1(3):249-56. doi: <https://doi.org/10.1353/cpr.2007.0028>.
37. Thompson C, Crocket F. Race, Repair, and Youth Participatory Action Research in one Rural School. *Rural Educator*. 2022;43(1):1-12. doi: <https://doi.org/10.35608/ruraled.v43i1.1203>.
38. Trott CD. Children's constructive climate change engagement: Empowering awareness, agency, and action. *Environmental Education Research*. 2020;26(4):532-54. doi: <https://doi.org/10.1080/13504622.2019.1675594>.
39. Zoellner J, Zanko A, Price B, Bonner J, Hill JL. Exploring community gardens in a health disparate population: Findings from a mixed methods pilot study. *Progress in Community Health Partnerships: Research, Education, and Action*. 2012;6(2):153-65. doi: <https://doi.org/10.1353/cpr.2012.0014>.
40. Debenham J, Birrell L, Newton NC, Devine EK, Champion KE, Stapinski LA, et al. Co-design of digital public health substance use resources: A collaboration between young people and experts. *Health Promotion Journal of Australia*. 2025;36(1):e874. doi: <https://doi.org/10.1002/hpja.874>.
41. Rácz A, Sik D. Digital Technology-Based Research With Young People in the Context of Hungarian Child Protection. In: Roth M, Alfandari R, Crous G, editors. *Participatory Research on Child Maltreatment with Children and Adult Survivors*. Emerald Publishing Limited; 2023. p. 129-44.
42. Bevan Jones R, Stallard P, Agha SS, Rice S, Werner-Seidler A, Stasiak K, et al. Practitioner review: Co-design of digital mental health technologies with children and young people. *Journal of Child Psychology and Psychiatry*. 2020;61(8):928-40. doi: <https://doi.org/10.1111/jcpp.13258>.
43. Lewis CC, Taba M, Allen TB, Caldwell PH, Skinner SR, Kang M, et al. Developing an Educational Resource Aimed at Improving Adolescent Digital Health Literacy: Using Co-Design as Research Methodology. *J Med Internet Res*. 2024;26:e49453. doi: <https://doi.org/10.2196/49453>.
44. Ludlow K, Russell JK, Ryan B, Brown RL, Joynt T, Uhlmann LR, et al. Co-designing a digital mental health platform, "Momentum", with young people aged 7-17: A qualitative study. *DIGITAL HEALTH*. 2023;9:20552076231216410. doi: <https://doi.org/10.1177/20552076231216410>.
45. Porche MV, Folk JB, Tolou-Shams M, Fortuna LR. Researchers' Perspectives on Digital Mental Health Intervention Co-Design With Marginalized Community Stakeholder Youth and Families. *Frontiers in Psychiatry*. 2022;Volume 13 - 2022. doi: <https://doi.org/10.3389/fpsy.2022.867460>.
46. Collier DR. Re-Imagining Research Partnerships: Thinking through" Co-Research" and Ethical Practice with Children and Youth. *Studies in Social Justice*. 2019;13(1). doi: <https://doi.org/10.26522/ssj.v13i1.1926>.
47. Zelenko O, Hides L, Kavanagh D, Stoyanov S, Quek L-H, Tulloch K, et al. Using Participatory Design (PD) as youth engagement strategy to inform design and development of evidence-based wellbeing e-tools. *Young and Well CRC Connect* 2014. 2014.
48. Havukainen M, H. LT, Sini K, Janne J, and Sutinen E. Co-designing Digital Games Across the Boundary of Childhood and Youth. *International Journal of Human-Computer Interaction*. 2025;41(5):3369-87. doi: <https://doi.org/10.1080/10447318.2024.2338328>.
49. Thabrew H, Fleming T, Hetrick S, Merry S. Co-design of eHealth Interventions With Children and Young People. *Frontiers in Psychiatry*. 2018;Volume 9 - 2018. doi: <https://doi.org/10.3389/fpsy.2018.00481>.
50. Anselma M, Altenburg T, Chinapaw M. Kids in Action: The protocol of a Youth Participatory Action Research

project to promote physical activity and dietary behaviour. *BMJ open*. 2019;9(3):e025584. doi: <https://doi.org/10.1136/bmjopen-2018-025584>.

51. Donovan D. How children represent sustainable consumption through participatory action research and co-design of visual narratives. *International Journal of Consumer Studies*. 2016;40(5):562-74. doi: <https://doi.org/10.1111/ijcs.12301>.

52. Graham A, Simmons C, Truscott J. 'I'm more confident now, I was really quiet': exploring the potential benefits of child-led research. *International Journal of Qualitative Studies in Education*. 2017;30(2):190-205. doi: <https://doi.org/10.1080/09518398.2016.1242803>.

53. Michail S, Kellett M. Child-led research in the context of Australian social welfare practice. *Child & Family Social Work*. 2015;20(4):387-95. doi: <https://doi.org/10.1111/cfs.12087>.

54. Buckley-Marudas MF, Soltis S. What youth care about: Exploring topic identification for youth-led research in school. *The Urban Review*. 2020;52(2):331-50. doi: <https://doi.org/10.1007/s11256-019-00530-5>.

55. Carrington S, Bland D, Brady K. Training young people as researchers to investigate engagement and disengagement in the middle years. *International Journal of Inclusive Education*. 2010;14(5):449-62. doi: <https://doi.org/10.1080/13603110802504945>.

56. Anyon Y, Bender K, Kennedy H, Dechants J. A systematic review of youth participatory action research (YPAR) in the United States: Methodologies, youth outcomes, and future directions. *Health Education & Behavior*. 2018;45(6):865-78. doi: <https://doi.org/10.1177/1090198118769357>.

57. Famaye T, Arastoopour IG, and Adisa I. Shifting roles and slow research: children's roles in participatory co-design of critical machine learning activities and technologies. *Behaviour & Information Technology*. 2025;44(5):912-33. doi: <https://doi.org/10.1080/0144929X.2024.2313147>.

58. Ward V, Parsons S, Kovshoff H, Crump B. Co-creation of Research and Design During a Coding Club With Autistic Students Using Multimodal Participatory Methods and Analysis. *Frontiers in Education*. 2022;Volume 7 - 2022. doi: <https://doi.org/10.3389/feduc.2022.864362>.

FINANCING

None.

CONFLICT OF INTEREST

None.

AUTHORSHIP CONTRIBUTION

Conceptualization: Iván Claudio Suazo-Galdamés, Alain Manuel Chaple-Gil, Mahia Saracostti.

Data curation: Iván Claudio Suazo-Galdamés, Alain Manuel Chaple-Gil, Mahia Saracostti.

Formal analysis: Iván Claudio Suazo-Galdamés, Alain Manuel Chaple-Gil, Mahia Saracostti.

Drafting - original draft: Iván Claudio Suazo-Galdamés, Alain Manuel Chaple-Gil, Mahia Saracostti.

Writing - proofreading and editing: Iván Claudio Suazo-Galdamés, Alain Manuel Chaple-Gil, Mahia Saracostti.