



Review article

Enhancing mental health in primary school children: a review of social emotional learning interventions with acceptance and commitment therapy components

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Abstract

Background: A robust social-emotional learning (SEL) repertoire in children has the potential to reduce mental health-related challenges impacting conduct problems, emotional distress, and academic achievement. However, achieving consensus around the key components of SEL-based interventions in primary schools remains challenging.

Methods: This scoping review aimed to investigate the applications and efficacy of evidence-based SEL practice, specifically acceptance and commitment therapy (ACT) interventions, in primary school settings. A comprehensive literature search identified six studies that incorporated ACT-based interventions within primary school contexts. The selected studies were analyzed using content analysis.

Results: The findings suggest a positive but tentative influence of ACT interventions on SEL outcomes and mental health of children. Variability in intervention implementation and outcome assessments was noted, indicating the need for more standardized approaches to evaluating ACT-based SEL programs in primary schools.

Conclusion: The review underscores the need for future studies to develop better alignment between ACT-based interventions, person-centered planning, and generalizability to enhance primary school students' emotional and psychological resilience. Further research should focus on refining intervention strategies, improving fidelity assessments, and ensuring sustainable long-term impacts of ACT-based SEL programs.

Keywords: Acceptance and commitment therapy; Mental health; Primary education; Social-emotional learning

Introduction

The World Health Organization (WHO) has recently brought to light the near epidemic levels of mental health crisis impacting youth (WHO, 2021). In fact, recent data suggest that school-age children are facing a higher risk of being affected by anxiety, depression, and other social-emotional or behavior challenges than in the past (PBS News Hour, 2021). This comes at the heels of the COVID-19 pandemic which notably increased children's stress levels (Liu and Doan, 2020). Emotional challenges, such as anxiety and depression, negatively impact not only well-being, but also academic performance of school children. Addressing these concerns within the school setting may improve both emotional well-being and academic outcomes, reinforcing the importance of integrating mental health support programs within primary education (Mundy et al., 2023).

Therefore, it appears more important than ever to give school children the necessary tools to support lifelong usage of empirically validated social-emotional health self-manage-

ment techniques. The importance of this issue can be seen by steps taken around the world, for example, in the United States' new initiative for schools to fulfill the Collaborative for Academic, Social, and Emotional Learning (CASEL) standards in daily curriculum (Frye et al., 2022). In fact, there appears to be a body of research which demonstrates that preventative measures to build the social-emotional learning (SEL) of children have proven to reduce mental health related challenges impacting conduct problems, emotional distress, and academic achievement (Gutman and Schoon, 2015), as well as improve the overall school climate (Yang et al., 2020). However, the degree to which SEL programs targeting more complex linguistic and cognitive behavioral change through acceptance and commitment therapy or training (ACT) are being applied in the critical primary school years is unknown. This review therefore aims to answer the following question: *What is the current state of evidence on the application and effectiveness of ACT-based interventions for supporting SEL in primary school settings?*

To support this inquiry, the review also explores the key characteristics of these interventions, their reported

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outcomes, and existing methodological gaps in the current literature.

SEL curricula and interventions in primary schools

While primary schools around the world often implement curriculum and related support materials aimed at building traditional academic skills like reading and math (e.g., Yang, 2014), there appear to be less standardized practices in place when it comes to mental health support through social, emotional, and behavioral interventions. As evidenced by organizations like What Works Clearinghouse's undertaking of systematic procedures for such program evaluation (IES, 2021), this area of school practice is more in its infancy. Still, recent initiatives have been put in place to bolster social and emotional learning in schools, like CASEL's steps in advancing the understanding and implementation of SEL by targeting numerous areas (Schonert-Reichl et al., 2017): (1) Self-awareness: the ability to accurately recognize one's emotions and thoughts and their influence on behavior. This includes accurately assessing one's strengths and limitations and possessing a well-grounded sense of confidence and optimism. (2) Social awareness: the ability to understand the emotions, needs, and perspectives of others, and to take their perspectives into account when making decisions and taking action. (3) Self-management: the ability to manage one's emotions, thoughts, and behaviors effectively in different situations. This includes managing stress, controlling impulses, and motivating oneself to persist in the face of setbacks. (4) Relationship skills: the ability to establish and maintain healthy and supportive relationships with others. This includes communicating effectively, cooperating with others, resolving conflicts peacefully, and seeking help when needed. (5) Responsible decision-making: the

ability to make constructive choices about one's behavior and to solve problems effectively. This includes considering the consequences of one's actions, weighing different options, and making choices that are consistent with one's values and goals. While several meta-analyses and reviews have determined that SEL interventions are effective in increasing such relevant domains, as found in a review conducted by Ura et al. (2020), outcomes assessed are typically broad, with measurable and observable skills infrequently targeted and a lack of consensus surrounding definitions and measurement (Mondi et al., 2021).

SEL curricula and ACT

Acceptance and commitment therapy/training is a prime example of an intervention framework pulling from the science of behavior to bolster more observable, measurable, and generalizable skills. Specifically, ACT, known as a therapy in the psychotherapy context and a training when outside, is an approach grounded in language and cognition theories that stem from behaviorism with the goal of helping individuals in regulating the role that private events play in our observable actions (Dixon et al., 2020). It involves using verbal interventions to modify the purpose served by certain private events. Its aim is to enhance flexibility in thinking, foster connection with stimuli in the environment and within the individual, and develop contingencies for habits guided by chosen verbal stimuli where reinforcers are contacted for engagement in specific overt behaviors (Dixon et al., 2020). To better illustrate the applied connections between ACT and observable behavior change, see Table 1, where the psychological flexibility and inflexibility processes are operationally defined and include examples.

Table 1. Behavioral-based examples of the flexibility and inflexibility processes

Inflexibility process	Definition	Example thought	Flexibility process	Definition	Example thought
Fusion	Taking our thoughts and feelings literally, as if they are facts about the world rather than our internal experiences.	"Going to the doctor is too scary, they will find something wrong with me."	Defusion	Stepping back from our thoughts and feelings and seeing them as words and images in our heads.	"I'm noticing a thought about being afraid of the doctor. It's just a thought, not a fact."
Experiential avoidance	Trying to escape or avoid difficult thoughts or feelings.	"I'm feeling anxious about giving a presentation, so I'm going to skip it"	Acceptance	Tolerating and accepting difficult thoughts and feelings without trying to control them.	"I'm feeling anxious about my presentation, but I'm going to go through with it anyway."
Dominated by a concept of ourselves	Defining ourselves with our thoughts, feelings, and past experiences.	"I'm not a good enough writer, so I'm not going to try to write a book."	Self as context	Seeing ourselves as a context in which thoughts, feelings, and experiences come and go.	"I'm having thoughts about not being a good enough writer, but that doesn't mean I'm not capable of writing a book."
Focus on the past or future	Spending time dwelling on the past or worrying about the future.	"I have to do fifteen things tomorrow, I can't believe I said that yesterday, etc."	Present moment awareness	Focusing attention on the present moment.	"I notice the cool breeze against my skin, the sound of birds chirping, and the warmth of the sunlight on my face."
Lacking motivation	Not doing the things that are important to us.	"I want to start exercising, but I just don't feel like it."	Values clarity	Identifying what is important in our lives.	"I value my health, so I'm going to make a plan to start exercising."
Damaging behavioral habits	Engaging in repeated actions that are not helping us to achieve our goals.	"I am going home after work to drink my usual bottle of wine alone."	Committed action	Taking consistent and effective action in line with our values.	"I'm going to enroll in an evening dance class to get healthier and make new friends."

In fact, it has been discussed, that when looking globally at the research on ACT it appears to specifically align with the tenets of evidence-based applied behavior analysis (ABA) by focusing on observable behavior change, using data-based decision making, grounding interventions in sound theoretical framework, outlining procedures in a step-by-step format, aiming for change and application in the natural environment, and producing meaningful results that last over time (see ABA's seven dimensions of the science: behavioral, analytic, technological, conceptually systematic, applied, generality, effective; Baer et al., 1968). However, to date, there is limited research dissecting the specific ACT intervention components in behavioral terms that support best practices with primary school children in the school setting, outline the main strategies responsible for change, and provide systematic procedures to enable effective replication. Some recent systematic reviews have incorporated ACT-based studies looking at applications with children and adolescents (Arnold et al., 2022; Fang and Ding, 2020; Parmar et al., 2021). However, these reviews have looked at application in a broader context, including multiple settings and a wide age range of participants. Therefore, it makes it difficult to determine the nuances of feasibility and impact in specific contexts and populations, especially as it relates to the necessity of targeting primary school children's social emotional health for later school and adulthood success (Dusenbury and Weissberg, 2017).

Research aim

As a result of the dearth of research evaluating ACT interventions with the primary school population in the school setting, the decision was made to conduct a novel review of the research, investigating:

- What research exists evaluating the application of ACT-based interventions with primary school students in the school setting?
- What are the main characteristics of these studies (with a focus on observable and measurable outcomes)?
- What steps should be taken in the future to better develop impactful and replicable applications of ACT-based interventions with primary school students in the school setting?

Materials and methods

Eligibility criteria

In an effort to review all of the existing research on the application of ACT-based interventions with primary school students in the school setting, the following eligibility criteria was established: (1) peer-reviewed journal article, (2) predominant population focus on primary school students/the majority of participants under the age of 13, (3) use of an ACT-based intervention, (4) intervention conducted within/as a part of a primary school setting, (5) measurement of the effectiveness of the intervention on psychosocial outcomes or academic achievement, (6) published in English, but could be conducted anywhere in the world, (7) published after 1999, and (8) stated the use of some type of randomized controlled trial, quasi-experimental study, or single-case design.

Information sources and search strategy

An initial search was conducted using the EBSCOhost search engine, accessing the following databases: Academic Search

Ultimate, PsycArticles, and PsycInfo. These databases were selected as Academic Search Ultimate is a comprehensive multidisciplinary database that covers a wide range of disciplines, including psychology. PsycArticles and PsychINFO are both full-text databases with a primary focus on psychological literature. To ensure that the parameter of education was sufficiently captured in the search, the ERIC database was also used. Lastly, as ACT is part of the field of Contextual Behavior Science (CBS) an additional search was conducted within the Journal of Contextual Behavioral Science.

Selections of sources of evidence

The initial search of the three databases within EBSCOhost resulted in 147 potential matches with the given search terms (Intervention type: Social, emotional, behavioral, SEL, applied behavior analysis, ABA, ACT; Setting: School, primary, elementary; Delivery: Schoolwide, classroom wider, small groups, individual student, tier 1, tier 2, tier 3.). Using the same methodology resulted in 196 potential matches in the ERIC database and 320 possible matches in the Journal of Contextual Behavioral Science. Duplicate records ($n = 35$) were removed. Title reviews of the 628 possibilities resulted in the elimination of 619 of the records because of misalignment with the eligibility criteria. The full text of the remaining nine articles were retrieved and reviewed. Ultimately, six were deemed appropriate, with two being discarded based on setting and one based on participant population. The Prisma flow diagram (Haddaway et al., 2022) in Scheme 1 was created to depict the process.

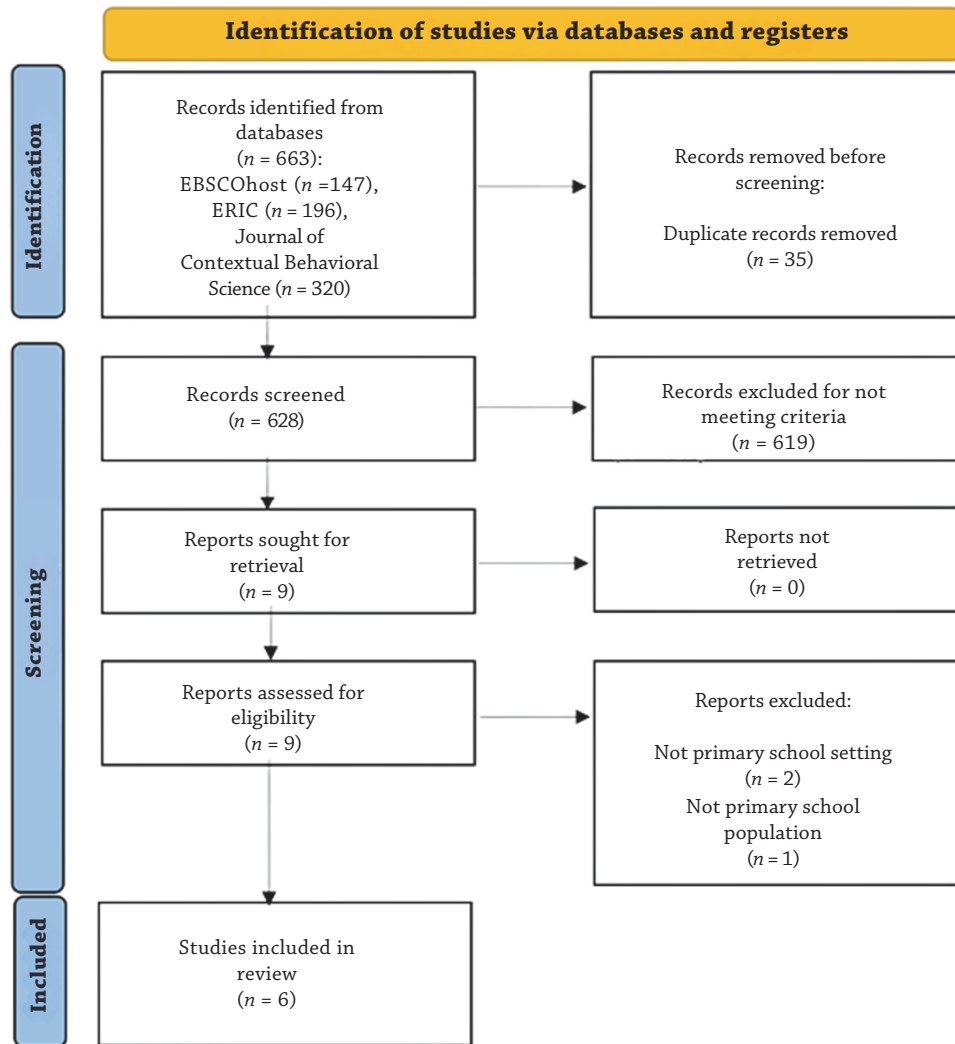
Initial data extraction and synthesis

The data extraction and synthesis process were divided into multiple steps. To begin, the first author reviewed the first articles by: (1) defining key variables relevant to the research question and (2) developing an extraction spreadsheet with the key variable categories. Next, the key variables were extracted to include: (1) the ACT-based intervention characteristics, including the specific components, duration, frequency, and format delivery, (2) participant characteristics, to include any provided demographic information such as age, gender, grade level, and diagnosis, (3) setting/location, (4) measures, to include any post and/or ongoing data collected on behavioral, emotional, and/or academic outcomes, (5) baseline, to describe the presence of specific baseline conditions and/or data collection procedures, (6) design, to specify whether an experimental, quasi-experimental, single-case, or other relevant design was used, and (7) results, to provide a brief overview of the impact of the intervention.

Results

Selection of sources of evidence

After extensive searching, six articles were selected for the review. They were the only articles identified as meeting the criteria of peer-reviewed publications reporting on the use of ACT interventions in a primary school with students as the target population. Most commonly, articles were removed from the search because of being conducted with older students and/or not taking place in the school setting. While primary schools can house different grade and age levels based on locale, the decision was made to include studies that either clearly stated that they were conducted in primary/elementary schools (ISCED Level 1) or included participants aged 13 or younger.



Scheme 1. Prisma flow diagram of article selection

Characteristics of sources of evidence

After selecting the six relevant articles, the characteristics of the sources of evidence were systematically reviewed. Information on the study designs, participants, measures/data collection, settings, interventions, and outcomes were extracted.

Study location, setting, and design

All the studies were conducted within the school setting. However, the locations and designs varied considerably. Of the six reviewed studies, three were based in the United States (Enoch and Dixon, 2017; Murrell et al., 2015; Wilson et al., 2021), while the last three were conducted in Finland (Keinonen et al., 2023), Australia (Tracey et al., 2018), and Azerbaijan (Nemati et al., 2023). The Enoch and Dixon (2017) study was included due to its direct use of ACT principles in its intervention design, despite its primary outcome focus on cognitive functioning. Specifically, the intervention emphasized mindfulness and present-moment awareness – core ACT processes that align with SEL competencies such as self-regulation and attentional control. The research settings ranged from more traditional publicly funded school classrooms (Enoch and Dixon, 2017; Keinonen et al., 2023; Murrell et al., 2015; Nemati et al., 2023) and nonprofit alternative schools (Wilson et al.,

2021) to outdoor school-based settings (Tracey et al., 2018). There was some variability in the designs used by the researchers to examine the impact of the intervention between the selected studies. The research designs ranged from single-case experimental models in Wilson et al. (2021), which provided a detailed look at individual responses to ACT, to the randomized controlled trials used in Keinonen et al. (2023), which tested the efficacy of a game-based ACT intervention. Other designs included quasi-experimental applications by Nemati et al. (2023), to assess the impact of ACT on stress and burnout, and multi-method designs in Tracey et al. (2018), which enriched quantitative data with qualitative insights from participants, a single-group pre-test/post-test design by Murrell et al. (2015) to measure behavioral changes and values alignment in children, and Enoch and Dixon's (2017) mixed factorial experimental design with control in a school to determine the effects of ACT on attention performance.

Participants

Each study began with comprehensive preparatory procedures of ethical compliance and informed consent with the participants. Participants in the studies were students from schools ranging from 6 to 15 years old, but the most common age range

Table 2. Characteristics of sources of evidence

Authors (year), country	Participants	Measures	Baseline	Intervention	Results	Setting	Design
Enoch and Dixon (2017), United States	40 children (mean age = 9.8 years), 20 in control and 20 in treatment.	Completion of validated attention tasks: Continuous Performance Test (CPT) a target-detection sustained vigilance task; Go/No-Go Task; Visual Cancellation Tasks. Social validity data were collected in the experimental group.	Attention tasks were completed by all participants at pre-test in week 1, consisting of 3 tasks lasting about 30 min in total.	The intervention consisted of 6 small group sessions over two weeks of 20 minutes each, where participants engaged in formal present moment activities, including breathing exercises, from the curriculum ACT for children with autism and emotional disorders.	The results of the study suggest that the ACT intervention was effective in positively impacting sustained attention. The experimental group demonstrated greater improvement than the control group.	School	A 2 (Experimental, Control) $\times$ 2 (Pre-test, Post-test) mixed factorial experimental design with a stratified randomization procedure.
Keinonen et al. (2023), Finland	106 elementary school children, mean age 11 (grades 4–6). 3 classes in control and 3 classes in treatment.	Pre-test and post-test assessment using a measure of Avoidance and Fusion Questionnaire for Youth (AFQ-Y8), Strengths and Difficulties Questionnaire (SDQ), and Health-Related Quality of Life (HRQoL/KINDL). Participants also filled out brief self-rating visual analog scales (VAS) for mood, school satisfaction, loneliness, and friendships.	Preassessment data collected a week before the intervention sessions, during TAU.	Mobile game-based ACT intervention where the player engages in ACT-based conversations with different characters in the game world, used in the school classrooms during regular school hours, on a weekly basis, for 4 weeks. Each of the 4 sessions included the game (about 45 min) followed by written applied tasks (about 15 min).	The ACT game intervention significantly increased psychological flexibility and reduced emotional and behavioral problems in children with initially high psychological inflexibility. However, significant changes were not seen in other groups.	Elementary school	A randomized controlled trial with a waitlist control group was used.
Murrell et al. (2015), United States	9 children (11–15 years; in 5th–8th grade), (5 females and 4 males) with comorbid attention-deficit/hyperactivity disorder, learning disorders, and behavior problems; complete data for only 7 participants.	The Behavior Assessment Scale for Children – Second Edition (BASC-2) and the Bull's-Eye Values Assessment (BVA) were administered to all participants at the pre- and post-intervention assessment points.	Preassessment data collected on the BASC-2 and BVA in an individual assessment session before the first group ACT session.	The intervention consisted of eight weekly one hour group sessions of ACT. The specific ACT interventions included mindfulness, acceptance, values clarification, and committed action. In addition to the group treatment, participants completed two 30 individual assessment sessions – one just before the first group and one just after the eighth group session.	Several significant Reliable Change Index scores on the BASC-2 and the BVA were found and other results approached statistical significance in the desirable direction.	Charter school	A single-group pre-test/post-test design was used.

Table 2. (continued)

Authors (year), country	Participants	Measures	Baseline	Intervention	Results	Setting	Design
Tracey et al. (2018), Australia	9 children, 8 males, 1 female; 11–12 years old; data were also collected on three teachers.	Post intervention open-ended interview questions on the social validity of the program for the students and teachers. Pre-test and post-test questionnaires to measure the children's psychological well-being and skills: Kessler 10, Children's Anxiety Life Inference Scale; Self-Description Questionnaire 1; Avoidance and Fusion Questionnaire for Youth; Child Acceptance and Mindfulness Measure.	The quantitative measures were collected in baseline during TAU.	Eight small group ACT sessions conducted in the outdoors (first 7 1 hr each, last session 2 hrs).	Some participating children reported improvements in psychological wellbeing and skill development.	Held during the school day by the special school that was attended during part of the week by the students, but outdoors in nature.	Multi-method design combining the administration of both post-intervention qualitative interviews with participating children and their school teachers, and quantitative pre and post-intervention questionnaires with participating children.
Nemati et al. (2023), Azerbaijan	16 elementary-school female students with specific learning disability (SLD).	Pre-test and post-test assessment using Gadzella's Student-Life Stress Inventory (SLSI) and School Burnout Inventory (SBI); both of which yielded numerical scores.	SLSI and SBI questionnaires scored during treatment as usual (TAU).	Acceptance and commitment therapy (ACT) program consisting of 8 weekly sessions, each lasting 40 min to 1 hr.	The ACT program significantly reduced academic stress and burnout in students with SLD compared to the control group.	School classrooms	A pre-test/post-test quasi-experimental design with a control group, collecting quantitative data.
Wilson et al. (2021), United States	4 elementary school students (ages 10, 10, 11, and 14) with disruptive and off-task behaviors; however only 2 completed full treatment.	Direct observation during 5-minute intervals using continuous 30-second recording of engagement in challenging and on task behaviors.	Data collection during TAU in the classroom, then later comparisons "reversals" to treatment control conditions of either pull out control or pull out no individualized ACT.	Individualized acceptance and commitment therapy (ACT) exercises as 30 min sessions using Dixon's ACT for Children with Autism curricular materials in a one-on-one pull out in-school session (up to 10 sessions).	Participants' on-task engagement and challenging behaviors improved significantly during the individualized ACT intervention phase compared to baseline and treatment-control conditions.	Nonprofit alternative school	Single-case experimental design.

in the descriptions is 10–14 years old. The study conducted by Nemati et al. (2023) did not specify the age of the students who participated in the study (but stated that it was conducted in a primary-school setting). The gender distribution also varied from study to study, with a group of only male participants (Wilson et al., 2021), only female participants (Nemati et al., 2023), or studies with students of both genders, with a predominance of female participants (Murrell et al., 2015), male participants (Keinonen et al., 2023; Tracey et al., 2018), or an equal distribution of participants (Enoch and Dixon, 2017).

Participants across the studies belonged to different population groups, and the authors indicated the following identifications of participants: non-Hispanic white, non-Hispanic black in Wilson et al. (2021); Australian, from New Zealand, and Aboriginal in Tracey et al. (2018); and African American and Hispanic in Murrell et al. (2015). The authors of other studies did not specify the identification of the participants. Additionally, of the six studies, two focused on students with specific learning disabilities, ADHD, or comorbid disorders (Murrell et al., 2015; Nemati et al., 2023), one of the studies focused on students with disruptive and off-task behaviors (Wilson et al., 2021), and others focused on those with general psychological well-being, flexibility, and mindfulness needs (Enoch and Dixon, 2017; Keinonen et al., 2023; Tracey et al., 2018).

Dependent variable (data collection)

Multiple research methods were used, including direct and indirect data collection procedures. Although the dependent variables were vast, none appeared to recruit participants for selecting targeted behaviors for change. The Wilson et al. (2021) dependent variables were participant engagement in challenging behaviors, defined as vocal disruption, physical aggression, and classroom disruption recorded during 5-min direct observation as opposed to on-task behavior. The study also included the collection of social validity data through closed- and open-ended questions administered following the intervention. Other studies used standardized assessment tools; with Nemati et al. (2023), using the School Burnout Inventory and Student-Life Stress Inventory to measure psychological states before and after the intervention, providing data on stress and burnout levels. Similarly, Keinonen et al. (2023), employed the psychological inflexibility Avoidance and Fusion Questionnaire for Youth (AFQ-Y8) alongside the Health-Related Quality of Life (HRQoL/KINDL) measure and Strengths and Difficulties Questionnaire (SDQ) to determine emotional and behavioral symptoms. Participants also filled out brief self-rating visual analog scales (VAS) for mood, school satisfaction, loneliness, and friendships. Pre-tests and post-tests were also conducted to evaluate the broader impacts of their game-based intervention. Some studies shared measurement methods, particularly those involving indirect assessments. Murrell et al. (2015) also used the AFQ-Y8, with the additions of the Behavior Assessment System for Children, Second Edition (BASC-2) including the Teacher Rating Scales (TRS), the Parent Rating Scales (PRS), a structured developmental history (SDH) form, student observation system (SOS), and a self-report of personality (SRP). However, only student data were obtained with categorization of responses and attention to the Emotional Symptoms Index (ESI), followed by the Bull's-Eye Values Assessment to assess congruence between importance and behavioral consistency of expressed valued domains of the children.

Similarly, Enoch and Dixon (2017) designed a study which focused on attention performance tasks, assessing changes in

attention and mindfulness capabilities with a target-detection sustained vigilance task Continuous Performance Test (CPT) where participants need to accurately detect targets among non-targets and maintain attention over time, Go/No-Go Tasks that assessed the children's ability to control impulsive responses, and Visual Cancellation Tasks that evaluated the speed and accuracy with which children could process visual information and respond to it.

In contrast, Tracey et al. (2018) combined the use of psychological well-being questionnaires with semi-structured qualitative interviews with children and teachers for assessing social validity of the program. To measure the children's skills and psychological wellbeing in pre-test and post-test, the following tools were used: the Kessler 10 (K10) to assess anxiety and depression symptoms experienced over the past four weeks prior to the study, the Children's Anxiety Life Interference Scale (CALIS), Self-Description Questionnaire I for measure of multidimensional self-concept, and the AFQ-Y.

Independent variable (intervention)

The researchers chose different procedures based on the theoretical basis of ACT (i.e., self-as-context, contact with the present moment, acceptance, defusion, values, and committed action). However, the targeting of these components differed in each study and did not appear to actively include participants in the intervention development process. Wilson et al. (2021) ACT intervention was tailored to the individual needs and history of the participants, with them receiving 30 min of structured sessions throughout the day. The sessions were carried out in a one-on-one manner in the school's ABA office. Throughout treatment, selected worksheets from Dixon (2014) were used, and after steady-state responses to ACT, pull-out control was administered before participants returned to the treatment stage. Enoch and Dixon (2017), chose a procedure where sessions were held within the school environment, allowing for minimal disruption to the student's daily routine. Six sessions were spread over two weeks. Each session lasted 20 minutes, totaling 120 minutes of active engagement with mindfulness-based activities. The activities were derived from the "ACT for Children with Autism and Emotional Challenges" curriculum by Dixon (2014). These sessions were conducted in small groups, each consisting of four participants. Participants engaged in present-moment activities and were not exposed to any other mindfulness-based activities during the study. Participants that were part of the control group did not engage in any ACT-related activities and no changes were made to their typical school day. In contrast, Nemati et al. (2023) utilized a program created by Pourtaieb (2020) that aims to fit the life experiences of students with specific learning disabilities. The treatment was structured around an eight-session program, each lasting between 40 minutes to 1 hour, and conducted weekly in a classroom setting. After post-test data were collected, the control group was transferred to the treatment condition.

Other novel approaches included Keinonen et al.'s (2023) utilization of a mobile game to deliver the intervention to the participants. The intervention consisted of weekly game sessions held during regular school hours, facilitated by project workers and attended by teachers. Each of the four chapters of the game took about 30–45 minutes to play, with an additional 10–15 minutes dedicated to written tasks designed to reinforce the game's lessons on wellbeing and applied to real-life situations. The 'ACT in the Outdoors' program described in the study by Tracey et al. (2018) was an innovative intervention that integrated principles of ACT and Adventure Therapy

(AT), intending to improve children's psychological wellbeing. The eight-session program took place outdoors and included various activities such as mindfulness exercises, team-building games, and individual challenges. Activities designed to promote psychological flexibility and personal growth included building balancing structures, nature walks, writing negative thoughts on rocks or sand, and breathing exercises. Murrell et al. (2015) based their intervention on the ACT for Kids protocol (Murrell et al., 2004) with a group of nine children with behavioral issues and learning disabilities. The study aimed to teach these youth how to effectively manage their emotions and behaviors through weekly group sessions over eight weeks. The sessions included didactic and experiential exercises designed to help the children engage with ACT principles like psychological flexibility, values clarification, and committed action.

Outcomes

Outcomes varied across the studies. Only two of the participants finished full treatment in the Wilson et al. (2021) study, but the results were notably positive, with baseline data of the engagement in challenging behavior high across participants, and on-task behavior moderately low, with decreases in challenging behavior after ACT treatment introduction and increases of on-task behavior for participants that received a full treatment program. In the study conducted by Enoch and Dixon (2017), the treatment effect on performance in attention-related tasks was the main subject of interest. The post-intervention results demonstrated a significant improvement in the participants' performance on attention tasks compared to the control group – which did not participate in the mindfulness activities. Specifically, there were notable reductions in total errors, false alarms, and missed targets on the continuous performance task (CPT-X), which suggests an enhancement in sustained attention and processing efficiency. Additionally, the results indicated a decrease in the time to completion on visual cancellation tasks, pointing to improved visual scanning and processing speed. However, no significant changes were observed in the Go/No-Go Task. Results from the study conducted by Nemati et al. (2023) indicated significant improvements in the experimental group over the control group in reducing academic stress and components of academic burnout. Specifically, there were notable decreases in emotional exhaustion, pessimism, and stress, while efficiency increased. Although the study by Keinonen et al. (2023) showed no significant differences between the intervention and control groups in psychological flexibility or health-related quality of life, there was a notable improvement in self-rated loneliness within the intervention group. The intervention appeared to be beneficial for children with higher levels of psychological inflexibility at baseline, as these children showed significant improvements post-intervention. Semi-structured interviews with children that were part of the Tracey et al. (2018) study showed improvements in self-calming, commitment to action, teamwork, trust, and respect for others. Children reported using the program's mindfulness techniques to effectively manage anger and anxiety. Additionally, in that study, the quantitative evaluations showed significant improvements in general school self-concept, levels of anxiety and depression, life-interference from anxiety, and mindfulness (for those attending at least seven sessions). Improvements were observed in some participants that took part in the Murrell et al. (2015) study, particularly in behaviors aligning more closely with their stated values, as assessed by the Bull's-Eye Values Assessment. However, the small sample size and high variability in attend-

ance due to various reasons (e.g., detention, testing) and incomplete data collection from assessments posed challenges in evaluating the effectiveness of the intervention consistently across participants.

Synthesis of key findings

Across the six studies, several converging themes emerge regarding the effectiveness and flexibility of ACT-based interventions in primary school settings. Despite variation in intervention formats – from individualized sessions and group-based protocols to outdoor activities and mobile games – all studies embedded core ACT principles such as present moment awareness, values clarification, and acceptance of one's own thoughts and emotions to enhance resilience and psychological flexibility. Improvements were observed in domains central to SEL, including self-regulation (Enoch and Dixon, 2017; Wilson et al., 2021), anxiety and emotional distress (Tracey et al., 2018), academic stress (Nemati et al., 2023), and value-driven behavior (Murrell et al., 2015). Importantly, these outcomes were often most pronounced among students with higher baseline difficulties – such as those with ADHD, learning disabilities, or elevated psychological inflexibility – suggesting that ACT may function most effectively as a Tier 2 or Tier 3 support within multi-tiered systems of support (MTSS).

Another noteworthy pattern is the adaptability of school-based ACT to diverse cultural, contextual, and delivery settings. Interventions were successfully implemented across four countries and a wide range of school types, including mainstream, charter, specialist, and alternative schools. While two randomized controlled trials (Enoch and Dixon, 2017; Keinonen et al., 2023) offer moderate-quality evidence, the consistent positive trends across quasi-experimental and single-group studies further suggest promise for real-world feasibility. Additionally, some formats – like game-based interventions – only demonstrated significant improvements among students with elevated initial difficulties (e.g., high psychological inflexibility), indicating that personalization or stratification of ACT delivery may enhance its impact. Together, these findings reinforce the potential of ACT, not only as a therapeutic tool but also as a strategic, flexible framework for SEL development in diverse primary school populations.

Discussion

This review aimed to fill existing gaps in the literature and support the growing fields of SEL and ACT by determining what research exists evaluating the application of ACT-based interventions with primary school students in the school setting and their main characteristics. While previous research compilations have looked at ACT in schools, the targets have usually included older students. However, the plethora of research supporting the value of early intervention and training in the social emotional well-being of younger children (Blewitt et al., 2018) exemplifies the need for more research in this area. Furthermore, the known challenges with defining and measuring SEL interventions with younger populations (Mondi et al., 2021) supports the need for more work in this field surrounding consistency in procedure development, application, and evaluation. Conclusions drawn from this review support these existing findings, verify the need for more systematic interventions and research in this area, and provide valuable guidance for establishing those practices.

It was clear from this review that very little published research exists evaluating the applications of ACT-based inter-

ventions with primary-school children in the school setting. Those that do exist appear to positively impact some aspects of social-emotional wellbeing in primary school children, with those with more significant needs benefiting most. However, components like design and assessment measures differed widely. Overall, there was a majority reliance on indirect assessment measures, bringing into question the transferability of results from the clinical to practical setting. The intensity of the interventions, as total length of the intervention and session length, varied considerably within studies, making it challenging to draw overarching conclusions about best practices in school-based ACT interventions. However, the diversity in location and setting applications may indicate a growing global interest in using ACT to develop a variety of skills in school-age children and in addressing youth behavioral and psychological issues, especially over the past five years. In addition, these varied applications of ACT with different groups suggest flexibility in intervention methodology and the potential for cultural adaptation of the intervention for training and therapy.

Overall, a closer look at all the article interventions showed frameworks fully consistent with the principles of ACT. Meaning, for example, interventions were often described using ACT terms underlying psychological flexibility (e.g., values, self-as-context, etc.). Unfortunately, articles did not demonstrate how the intervention was assessed for fidelity of application during delivery (e.g., fidelity checklist scores or inter-observer agreement percentages) or include follow-up data on the lasting impact of the intervention or steps. This aligns with an additional concern raised when assessing the measurement practices commonly used throughout the studies (i.e., reliance on indirect measures evaluated in a clinical context). Furthermore, it was unclear throughout the studies if person-centered target behaviors were targeted (e.g., chosen in collaboration with the participants/making participants more actively involved in the intervention development process). It has been noted throughout the literature that a more person-centered approach to behavior change can have a more meaningful and lasting impact (Claes et al., 2010), something that may be valuable to consider in future intervention development.

In considering the results of this review, it appears that more needs to be done to outline consistent practices of ACT-based SEL interventions in primary schools. While there is an abundance of research supporting the use of ACT-based interventions (e.g., Bai et al., 2020), more guidance may need to be provided in the literature for how ACT-based SEL interventions can garner more structure and better outcomes. However, care should be taken when interpreting these findings. The limited number of available studies, varying quality of the studies, and missing data on the generalizability of their findings, make it challenging to draw conclusions about ACT-based interventions in primary school. Another limitation of the current review is potential publication bias, since only peer-reviewed studies in the English language were selected. A later review might take steps to broaden the reach.

Conclusion

Integrating evidence-based SEL practices in primary education is imperative for enhancing student well-being at the primary level and beyond. This review underscores a compelling need for more systematic research into ACT-based interventions for SE practices within primary school settings. Despite preliminary findings suggesting potential benefits, future in-

vestigations should adopt a more rigorous, evidence-based framework, thereby ensuring the interventions are not only effective but also replicable and demonstrate sustainable results. This strategic focus on methodological refinement will be critical in advancing applications of ACT interventions for the betterment of primary school children's social-emotional development.

Ethics approval

An ethical statement was unnecessary as study data were extracted from previously published articles.

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Conflict of interest

The authors have no conflict of interest to declare with respect to the research, authorship, and/or publication of this work.

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