frontiers | Frontiers in Education

TYPE Systematic Review
PUBLISHED 26 July 2023
DOI 10.3389/feduc.2023.1228269

OPEN ACCESS

EDITED BY
Myint Swe Khine,
Curtin University, Australia

REVIEWED BY
Othman Abu Khurma,
Emirates College for Advanced Education,
United Arab Emirates
Yang Liu,
Shanghai Maritime University, China

*CORRESPONDENCE
Yu Takizawa
✉ yu.takizawa@uqconnect.edu.au

RECEIVED 24 May 2023
ACCEPTED 13 June 2023
PUBLISHED 26 July 2023

CITATION
Takizawa Y, Bambling M, Matsumoto Y, Ishimoto Y and Edirippulige S (2023) Effectiveness of universal school-based social-emotional learning programs in promoting social-emotional skills, attitudes towards self and others, positive social behaviors, and improving emotional and conduct problems among Japanese children: a meta-analytic review.
Front. Educ. 8:1228269.
doi: 10.3389/feduc.2023.1228269

Effectiveness of universal school-based social-emotional learning programs in promoting social-emotional skills, attitudes towards self and others, positive social behaviors, and improving emotional and conduct problems among Japanese children: a meta-analytic review

Yu Takizawa[1]*, Matthew Bambling[2], Yuki Matsumoto[3], Yuma Ishimoto[4] and Sisira Edirippulige[1]

[1]Centre for Health Services Research, Faculty of Medicine, The University of Queensland, Woolloongabba, QLD, Australia, [2]Greater Brisbane Clinical School, Medical School, Faculty of Medicine, The University of Queensland, Herston, QLD, Australia, [3]School of Human Life Sciences, Tokushima Bunri University, Tokushima, Tokushima, Japan, [4]Teacher Education Center, Tottori University, Tottori, Tottori, Japan

The implementation of universal school based Social–Emotional Learning (SEL) programs is increasing in Japanese schools with the aim of enhancing children's social–emotional skills and reducing mental health problems. However, there is a lack of meta-analyses evaluating the effectiveness of these programs in Japan that specifically include studies with control groups and examine program moderators. Conducting such a meta-analysis would be valuable for improving future implementations of SEL programs in Japan. The present meta-analysis analyzed 85 intervention studies with control groups to examine the effectiveness and moderators of universal school based SEL programs for Japanese children aged 5–18years. The analysis indicates that these programs have a small overall effect (ES=0.26), as well as small effects in improving social–emotional skills (ES=0.24), attitude toward the self and others (ES=0.30), positive social behavior (ES=0.31), conduct problem (ES=0.20), and emotional problem (ES=0.22) at post-intervention among Japanese children. The analysis further revealed that publication type, number of participants, and school level of children moderated the overall effects of universal school based SEL programs, suggesting potential biases in effect sizes reported in peer-reviewed journals published by scientific societies, lower effectiveness for older children, and decreased effectiveness when programs are delivered to larger numbers of children. Future research should explore more effective delivery methods for SEL programs, particularly for older children and larger groups, such as integrating community components and information and communication technology into the programs.

KEYWORDS

social-emotional learning, mental health, school-based intervention, Japanese children, cognitive behavioral therapy, depression, anxiety, conduct problem

1. Introduction

Children's mental health is a topic of great interest to Japanese educators and parents, as it has been shown to predict various long-term outcomes such as academic achievement, physical health, and socioeconomic status in adulthood (Gibbons and Silva, 2011; Bücker et al., 2018). However, the number of Japanese children diagnosed with mental disorders, such as mood disorders, behavioral disorders, and psychotic disorders, has increased from 117,000 to 329,000 between 1999 and 2020 (Ministry of Health, Labour and Welfare, 2021). Emotional problems, such as depression and anxiety, are the most prevalent mental health issues among Japanese children (Ministry of Education, Culture, Sports, Science and Technology Japan, 2021). A survey by the National Center for Child Health and Development (2021) of 4,629 Japanese children and their caregivers in grades 5–12 found that up to 30% of primary and secondary school students experience moderate to severe depression and anxiety.

The conduct problems characterized by violence and aggression are also increasing among Japanese children. The number of school-aged children's violence toward other students, teachers, other individuals, and objects reported by schools increased from to 60,305 to 76,441 between 2010 and 2021 and the number of children's bullying reported by schools increased from 77,630 to 615,351 between 2010 and 2021 (Ministry of Health, Labour and Welfare, 2021). Associated with the prevalence of mental disorders, the number of suicides among Japanese children has consistently increased from 137 to 671 between 2011 and 2021 (Ministry of Health, Labour and Welfare, 2021). The number of school refusers in primary and junior high schools has also increased from 174,000 to 244,940 between 2010 and 2021 (Ministry of Health, Labour and Welfare, 2021). These findings highlight the urgent need for early intervention to promote mental health and reduce associated problems, such as suicide, school refusals, and bullying among Japanese school-aged children.

Schools are the primary sites for providing universal early intervention to Japanese school-aged children since schooling is a common domain that almost all children participate in Graham et al. (2011). In the past decade, Japanese schools have increasingly adopted universal school-based social–emotional learning (SEL) programs to enhance children's social–emotional (SE) skills for promoting their mental health and reducing associated problems, such as suicide, school refusal, and bullying. SEL programs involve providing structured lessons that help students develop SE skills, such as self-awareness (e.g., recognizing emotions, strengths, limitations, and values), self-management (e.g., regulating emotions and behaviors), social awareness (e.g., taking perspectives and empathizing with others from diverse backgrounds and cultures), relationship skills (e.g., establishing and maintaining healthy relationships), and responsible decision-making (e.g., making constructive choices across varied situations), for promoting personal development, social relationships, ethical behavior, and productive work (Taylor et al., 2017). SEL programs are typically delivered by teachers and mental health professionals in Japan. There are different types of universal school based SEL intervention programs currently offered in Japanese schools, including group social skills training (SST) (Harada and Watanabe, 2021), group cognitive-behavioral therapy program (Group CBT program) (Yamamoto et al., 2017), stress-management education (Tanaka et al., 2014), and other programs.

SST involves systematically teaching SE skills by breaking down complex behaviors into their constituent elements, demonstrating those skills through role plays, engaging students in practicing those skills through role plays, providing positive and corrective feedback to improve performance, additional role-play practice, and developing assignments to practice those skills in natural interactions (de Mooij et al., 2020; Harada and Watanabe, 2021). SST programs currently implemented in Japan primarily focus on teaching relationship skills and social-awareness for promoting positive social behaviors and improving mental health of children. However, some SST programs also involve training of other skills, such as self-awareness, self-management, and/or responsible decision making depending on the needs of school (Harada and Watanabe, 2021). SST may involve multiple components, including psychoeducation (e.g., education of knowledge about behavior or group processes and social rules), psycho-physical components (e.g., training in physical exercises to improve posture, self-confidence, and trust in others), skills training (exercises in verbal and nonverbal communication, teamwork exercises, exercises to encourage and practice prosocial behavior and problem-solving), and cognitive-emotional components (activities to improve self-awareness, recognition of one's own and others' emotions, and emotion regulation) (Sancassiani et al., 2015; Ebata and Kamimura, 2018). In Japan, SST programs typically range between 2 and 11 lessons weekly, fortnightly, or monthly, with each lesson lasting 45–100 min.

The Group CBT program is rooted in the principles of CBT, which suggest that thought distortions and maladaptive behaviors contribute to the development and maintenance of psychological disorders. Its primary focus is on challenging and changing cognitive distortions and associated behaviors to improve emotional regulation and develop coping strategies for current problems (Hetrick et al., 2016; Einfeld et al., 2018. While Japanese schools implement group CBT to teach cognitive-behavioral self-management skills, such as cognitive restructuring, muscle relaxation, and diaphragm breathing techniques, these programs also train other SE skills, including self-awareness, social awareness, relationship skills, and responsible decision-making. Notable examples of group CBT programs implemented in Japanese schools include the Fun Friends program (Matsumoto and Shimizu, 2016), You Can Do It! (Yamamoto et al., 2017), and the Journey of Brave (Urao et al., 2021). Each program typically provides 8–12 weekly or bi-weekly lessons as part of the school curriculum, with each lesson lasting for 45–60 min (Matsumoto and Shimizu, 2016; Yamamoto et al., 2017; Urao et al., 2021). For instance, the Journey of Brave program emphasizes developing SE skills in each lesson, including self-awareness (e.g., recognizing basic emotions and monitoring personal feelings), social awareness (e.g., understanding others' emotions), self-management skills (e.g., understanding bodily reactions, relaxation techniques, identifying cognitive distortions, and coping with rumination and cognitive restructuring), relationship skills (e.g., assertiveness training), and responsible decision-making (e.g., setting goals with an analysis of problems and situations) (Urao et al., 2021).

Stress management education primarily focuses on teaching self-management and self-awareness skills to cope with psychological stress resulting from various stressors in daily life, such as the absence of a supportive caregiver, poverty, friendship and interpersonal difficulties, heavy academic workloads, and bullying (Okazaki and Ando, 2011; Tanaka et al., 2014). Stress management education is

based on the premise that psychological stress is an inevitable and necessary component of life, and maintaining a fine balance of psychological stress can be healthy and promote physical, social, emotional, and intellectual development. It also recognizes that how individuals cope with stress is a key determinant of long-term psychological, emotional, and physiological outcomes of stress (Takahashi and Sakano, 2010). Stress management education in Japan generally consists of 1–5 lessons on a weekly or monthly basis (Kita and Fujiwara, 2012; Taniguchi, 2013; Tanaka et al., 2014). These lessons typically include psychoeducation about stress and opportunities to develop stress-coping skills informed by CBT and SST, such as cognitive restructuring, problem-solving skills, relaxation techniques (e.g., muscle relaxation and breathing), social awareness, and self-awareness (Kita and Fujiwara, 2012; Taniguchi, 2013; Tanaka et al., 2014).

There are also other structured programs implemented among Japanese schools to promote SE skills that are not specifically categorized as SST, Group-CBT, or stress management education. The examples include SEL-8 (Yamada and Koizumi, 2020), Top-Self (Yamasaki et al., 2015), lifestyle enhancement program (Kita and Fujiwara, 2012) and developmental educational programs (Togo, 2010). SEL-8 and Top-Self provide 10–12 monthly lessons, with each lesson lasting 45–60 min and integrating theories and components of social-skills training, stress-management education, and CBT to promote self-awareness, social-awareness, self-management, relationship skills, and responsible decision-making (Kagawa and Koizumi, 2013). For example, SEL-8 uses a social-skills training structure, systematically teaching SE skills by breaking down complex behaviors into their elements, modeling skills in role plays, allowing students to practice those skills in role plays, providing constructive feedback to improve performance, and developing assignments to practice those skills in naturally occurring interactions in school life (Yamasaki et al., 2015). The lifestyle enhancement program developed by Kita and Fujiwara (2012) provides 10 lessons, each lasting 15 min, with structured activities to train self-awareness (e.g., understanding one's emotions), social-awareness (e.g., empathy), self-management skills for controlling emotions (e.g., diaphragm breathing and practicing upright posture), behaviors (e.g., dietary and sleeping habits and hygiene), and relationship skills. The developmental education program developed by Togo (2010) provides four lessons, each lasting 50 min, with structured activities to promote children's self-awareness, social-awareness, and relationship skills.

The majority of meta-analyses that investigated the effectiveness of school-based SEL programs were conducted in Western contexts such as the United States, the United Kingdom, and Australia. These meta-analyses found that universal SEL programs exhibited small to medium effect sizes (ES = 0.20–0.50) for improving SE skills, attitudes toward the self and others, positive social behavior, conduct problems, emotional problem, and academic performance at post-intervention and follow-up (Durlak et al., 2011; Taylor et al., 2017).

Some meta-analyses identified moderators of the effectiveness of SEL programs. For instance, the effectiveness of programs as rated by parents, teachers, and other observers was more effective than those rated by students (Korpershoek et al., 2016). School-based SEL programs were more effective for students in the lower grades than those in the higher grades (Wilson and Lipsey, 2007; Korpershoek et al., 2016). Moreover, studies published in peer-reviewed journals reported higher effect sizes than unpublished studies, potentially due to publication bias for studies with significant results (Durlak et al., 2011; Mlinarić et al., 2017). The moderating effect of the number of sessions of SEL programs found by previous meta-analyses is mixed. Some found that the number of sessions of SEL programs do not moderate the effect (van de Sande et al., 2019), while others found that SEL programs with a larger number of sessions are more effective (Korpershoek et al., 2016). However, some meta-analyses found that SEL programs with a fewer number of sessions are more effective (Durlak et al., 2011). Meta-analyses also found that programs delivered by teachers were more effective than those delivered by non-school personnel, such as researchers and external mental health professionals (Durlak et al., 2011). In addition, previous meta-analyses found that study quality does not moderate the effectiveness of the program (Durlak et al., 2011). A previous meta-analysis also found that school-based interventions incorporating community components, such as support from parents and local agencies (including community social workers, counselors, and psychologists), are more effective than school based interventions without community components (Goldberg et al., 2019).

Previous meta-analyses provide valuable insights regarding the effectiveness and moderators of SEL programs. However, a limitation of these meta-analyses conducted in Western contexts is that they typically do not include Japanese studies. This is likely due to the fact that the majority of Japanese studies are published only in Japanese and are electronically inaccessible. Therefore, the results of previous meta-analyses conducted outside Japan may not be generalizable to Japanese children due to differences in the delivery of school-based mental health interventions. For example, school-based mental health intervention programs in Japan tend to be delivered in fewer sessions (e.g., 1–12 sessions) compared to those in Western contexts (average 40.8 sessions; Durlak et al., 2011), as the Japanese academic curriculum has limited flexibility and time to accommodate school-based mental health interventions into the academic curriculum due to the strict education guidelines enforced by the Japanese government (Sawada and Ishimoto, 2021).

There are two previous meta-analyses that exclusively examined the effect sizes of school-based SEL programs for promoting the mental health of Japanese children. Takahashi and Ozeki (2011) conducted a meta-analysis of 14 studies and found that universal school-based SST is effective for reducing internalizing problems (ES = 1.62) and externalizing problems (ES = 0.80) among Japanese children. Morita et al. (2015) also conducted a meta-analysis of 12 studies and found that CBT-based stress management programs exhibited a small effect size (ES = 0.26) for reducing emotional problem among children. However, unlike meta-analyses conducted in Western contexts, these meta-analyses included studies without a control group and estimated effect sizes without accounting for baseline differences between intervention and control groups. Therefore, the effect sizes from these meta-analyses may not accurately represent the effectiveness of school-based SEL programs for promoting the mental health of Japanese children. Moreover, the scopes of these meta-analyses were, respectively, limited to SST and stress management education, and they did not examine the potential moderators of SEL programs. These findings suggest that there is no existing meta-analysis that accurately evaluated the effectiveness of universal school-based SEL programs in Japan by including only studies with control groups and that examines the moderators of SEL programs in Japan, even though the results from such a meta-analysis

would be useful for improving the future implementation of SEL programs in Japan.

To address the gap in existing research, the present meta-analysis aimed to conduct the first meta-analysis of the effectiveness of universal school-based mental health intervention programs in improving SE skills, attitudes toward the self and others, positive social behavior, conduct problem, emotional problem, and academic performance among Japanese school-aged children. This meta-analysis specifically examined the effectiveness of SEL programs on these outcome categories, as previous meta-analyses have commonly investigated the effectiveness of SEL programs in these areas (Durlak et al., 2011; Taylor et al., 2017). To ensure the accuracy of effect size estimation, the analysis only included studies with control groups. In addition to the analysis of effect size, the present meta-analysis aimed to explore the potential moderators of the outcomes of universal school-based mental health intervention programs in Japan. This meta-analysis specifically explored the potential moderating effects of study characteristics (publication type, publication year, facilitator type, intervention time per session, intervention frequency, intervention session number, number of participants, attrition rate, rater of outcome, study quality, school level of children, and intervention type) on the outcomes of universal school-based SEL programs for Japanese children, building upon previous meta-analyses that investigated moderators of SEL programs (Korpershoek et al., 2016; Wigelsworth et al., 2016). The results of the present meta-analysis will broaden and deepen the knowledge of school-based mental health intervention outside of the Western context.

There are three research questions addressed in the present meta-analysis:

1. Are universal school-based SEL programs effective in improving SE skills, attitudes toward the self and others, positive social behavior, conduct problems, emotional problem, and academic performance among Japanese school-aged children at post-intervention?
2. Are universal school-based SEL programs effective in improving SE skills, attitudes toward the self and others, positive social behavior, conduct problems, emotional problem, and academic performance among Japanese school-aged children at follow-up?
3. Do study characteristics moderate the outcomes of universal school-based SEL programs for Japanese children?

2. Methods

2.1. Literature search

A systematic search was conducted on six databases in English (PubMed, PsychINFO, Web of Science, and Dissertation Abstracts) and in Japanese (CiNii Articles and J-STAGE) to obtain a representative sample of published studies. The search involved a combination of the following search terms and their variations in English and Japanese language: Japanese, social–emotional, learning, skills, mental health, psychology, intervention, program, training, children, adolescents, students, classroom, and schools. Additionally, the reference lists of each identified study and reviews of studies were examined to identify any relevant studies.

2.2. Inclusion criteria

The studies that were considered eligible for the meta-analysis met the following criteria: (a) written in English or Japanese; (b) published; (c) designed to improve one or more SE skills (i.e., self-awareness, self-management, social awareness, relationship skills, and responsible decision making); (d) targeted students in Grades K-12; (e) included a control group; and (f) provided sufficient statistical information (e.g., sample size, means, and standard deviations for both intervention and control groups) for effect sizes to be calculated at post-intervention and/or follow-up. There were no restrictions imposed on the year of publication for the included studies in the meta-analysis.

2.3. Exclusion criteria

The present meta-analysis excluded studies that exclusively targeted students with pre-existing mental, developmental, or learning disorders and that primarily involved the promotion of academic achievement. Studies that focused solely on the promotion of the physical health and development of students, such as programs aiming to develop healthy nutrition and exercise patterns, were also excluded. Additionally, studies that implemented mental health intervention to students outside the school setting were not included in the present meta-analysis.

2.4. Coding of studies

Multiple interventions from the same study were coded separately if the study provided data related to distinct intervention formats (e.g., group CBT program versus SST) and recruited separate cohorts, or if a single study reported the results of an original cohort and a replication sample. Multiple papers evaluating the same intervention but containing different data on outcomes at post-intervention or follow-up for the same cohort were combined into a single study.

The dependent variables in the present meta-analysis were six student outcomes, including SE skills (e.g., self-awareness, social awareness, self-management, relationship skills, and responsible decision making), attitudes toward the self and others (e.g., self-esteem, self-concept, attitudes toward school and teachers, beliefs about violence, helping others, social justice, and drug use), positive social behavior (e.g., the quality of relationships with others, such as peers and teachers, as measured by students, teachers, parents, or independent observers), conduct problem (e.g., disruptive class behavior, noncompliance, aggression, bullying, school suspension, and delinquent acts), emotional problem (e.g., internalized mental health issues such as depression, anxiety, fear, stress, and social withdrawal), and academic performance (e.g., standardized and unstandardized test scores across subjects such as math, writing, and reading, derived from school records).

Publication format of studies were coded as peer reviewed journal article published by an academic society or other (e.g., an article published through university/college, conference proceeding, thesis,

and preprint). Year of study (up to 2010 or 2011 onward), school level of students (elementary school, middle school, or high school), minutes per session of intervention, intervention frequency (weekly/more than once a week, biweekly/three times a month, or monthly/bi-monthly), intervention session number, number of participants, attrition rate, rater of outcome (children or other) were coded.

The type of intervention in each study was coded in reference to the descriptions provided by the authors. Universal school-based SEL programs were classified as SST if the program involved structured lessons aimed at systematically training SE skills to promote social behavior and mental health in children. If the program was described as CBT-based, involving structured lessons for training cognitive-behavioral self-management skills like cognitive restructuring and muscle relaxation, with or without training in other SE skills, it was categorized as CBT. Programs described as stress management education, focusing on teaching self-management skills for coping with psychological distress, with or without training in other SE skills, were classified under stress management education. If the program did not fit into any of these categories (SST, CBT, or stress management education) but still provided structured lessons for training SE skills, it was classified as "other."

The facilitator of school-based mental health interventions was coded as either teachers or others. Specifically, the facilitator was coded as teachers when the intervention was solely delivered by teachers within the school without assistance from school counselors or external staff, such as university researchers and students. The facilitator was coded as other when the intervention was delivered by school counselors, external staff (e.g., university researchers and students), or a combination of teachers, school counselors, and/or external staff.

The study quality was coded using the Risk Of Bias In Non-randomized Studies—of Interventions (ROBINS-I) assessment tool (Sterne et al., 2016), which is recommended by the Cochrane Scientific Committee. Using ROBINS-I, the primary author coded the quality of each study (i.e., critical, high, moderate, or low) by assessing the level of risk bias in seven domains, namely, (1) bias due to confounding, (2) bias in selection of participants into the study, (3) bias in classification of interventions, (4) bias due to deviations from intended interventions, (5) bias due to missing data, (6) bias in measurement of outcomes, and (7) bias in selection of the reported result. The study created graphical presentations using Robvis (McGuinness, 2019; Supplementary Appendix A). Low risk on the ROBINS-I tool indicates that the study is comparable to a well-performed randomized trial in its domain. Hence, a non-randomized study is considered to exhibit low risk only in exceptional cases (Sterne et al., 2016). Medium risk indicates that the study is sound for a non-randomized study with regard to this domain but cannot be considered comparable to a well-performed randomized trial. Serious risk of bias means that the study has some important problems in this domain. Critical risk of bias indicates that the study is too problematic in this domain to provide any useful evidence on the effects of intervention. No information means that the study provides insufficient information to make a judgment about risk of bias for this domain.

All coding was initially conducted by the primary author. To ensure the reliability of coding, the co-author (YM) subsequently checked the coding of the primary author. Any disagreement in coding for each study was eventually resolved through discussions. Management of the study records and the removal of duplicated data during study extraction were conducted by the Zotero version 6 (Roy Rosenzweig Center for History and New Media, 2022).

2.5. Data analysis

To address research questions, meta-analysis with meta-regression was performed by entering statistical and coding data into Comprehensive Meta-Analysis 3.0 (CMA; Borenstein et al., 2013). Dichotomous variables, such as publication type, rater of outcome, and facilitator of program, were converted to numerical variables in CMA by assigning 1 to one category and 2 to the other. Moderators were entered into CMA as numerical variables, including publication type (1 = peer-reviewed journal articles published by academic society, 2 = other), facilitator (1 = teacher, 2 = other), intervention time per session in minutes, intervention frequency (1 = weekly or more, 2 = biweekly, 3 = monthly), intervention session number, number of participants, attrition rate, rater of outcome (1 = children, 2 = other), study quality (1 = low risk of bias, 2 = moderate risk of bias, 3 = serious risk of bias, 4 = critical risk of bias), and school level of children (1 = elementary school, 2 = middle school, 3 = high school). The intervention type (SST, Group CBT, Stress Management Education, and Other) was coded as a categorical variable using the dummy coding function of the CMA.

Hedge's g was used as the effect size index, which is a standardized mean difference between two groups that is adjusted for pre-intervention differences between the intervention and control groups based on pooled standard deviations. Hedge's *g* is particularly useful for meta-analyses of studies with different sample sizes (Lakens, 2013). A positive effect size indicates that the intervention group performed better than the control group, and the effects were defined at the student level. A small effect size value is 0.2, a moderate effect size value is 0.5, and a large effect size value is 0.8 (Cohen, 1988).

To address the research question 1, the researchers calculated the overall effect size of SEL programs and their effects on each outcome category at post-intervention. To address the research question 2, for studies that evaluated the effectiveness of interventions at follow-up, the overall effect size and effect size for each outcome category at both post-intervention and follow-up were calculated. To address the research question 3, the researchers examined the significance of individual moderators on the overall effect of SEL programs and their effect on each outcome category in the first step. In the second step, all moderators, including numerical and categorical moderators, were examined together to determine their significance on the overall effect of SEL programs and their effect on each outcome category. Finally, only the moderators identified as significant in the second step were examined together again on the overall effect of SEL programs and their effect on each outcome category. In addition, the present meta-analysis employed the Egger's regression test to examine the presence of publication bias regarding the effects of SEL programs. The trim-and-fill method was utilized to estimate the potential impact of publication bias on the estimated effect sizes of SEL programs.

The present meta-analysis calculated one effect size per outcome category for each study. If a study included multiple measures of the same category, then the mean effect size for each category was calculated using CMA. Statistical significance was determined using a probability level of 0.05, and a mean effect size was considered

significantly different from zero when its 95% confidence intervals did not include zero. All analyses were performed using a random-effects model with maximum likelihood estimation (Lipsey and Wilson, 2001).

The significance of the heterogeneity of a group of effect sizes was examined through the Q and I^2 statistics and τ^2. A significant Q value suggests that studies are not drawn from a common population, whereas I^2 statistics reflects the degree of heterogeneity among a set of studies along a 0–100% scale. Finally, τ^2 represents the absolute value of heterogeneity.

3. Results

3.1. Descriptive characteristics of the reviewed studies

The systematic search resulted in a sample of 85 studies that reported 320 outcomes involving 26,793 children aged 5–18 years (Figure 1). The largest proportion of studies was published in peer-reviewed journals published by academic societies (54.1%) (Table 1). A large proportion of studies (30.6%) was also published in journals published by universities/colleges, because Japanese researchers typically publish their studies in university schools/faculties that publish journals that have limited peer review.

Intervention type was categorized into SST, SEL program, CBT, stress management education, and others. The last category included SEL-8 (Yamada and Koizumi, 2020), Top-Self (Yamasaki et al., 2015), developmental educational programs (Togo, 2007, 2010), a personal goal pursuing program (Kusaka, 2012), and lifestyle enhancement program (Kita and Fujiwara, 2012). None of the studies employed randomized controlled designs and produced a low risk of bias. Moreover, no study reported the detailed ethnic compositions of the participants, because, presumably, Japanese researchers typically assume that nearly all participants come from Japanese backgrounds. All the studies either had no incorporation or only limited incorporation of community components, such as support from parents and local agencies.

3.2. Effectiveness of SEL programs at post-intervention

With the exception of the effectiveness of SEL programs on academic performance, the results addressed the research question 1: Are universal school-based SEL programs effective in improving SE skills, attitudes toward the self and others, positive social behavior, conduct problems, emotional problem, and academic performance among Japanese school-aged children at post-intervention?

The grand study-level mean of effect size at post-intervention for 85 studies was significant ($ES = 0.26$, $p < 0.01$; $k = 85$; Table 2). The effect sizes for SE skills, attitude toward the self and others, positive social behavior, conduct problem, and emotional problem were significant ($ES = 0.20$–0.31, $p < 0.01$). Only one study (Kagawa and Koizumi, 2013) evaluated the effectiveness of intervention for

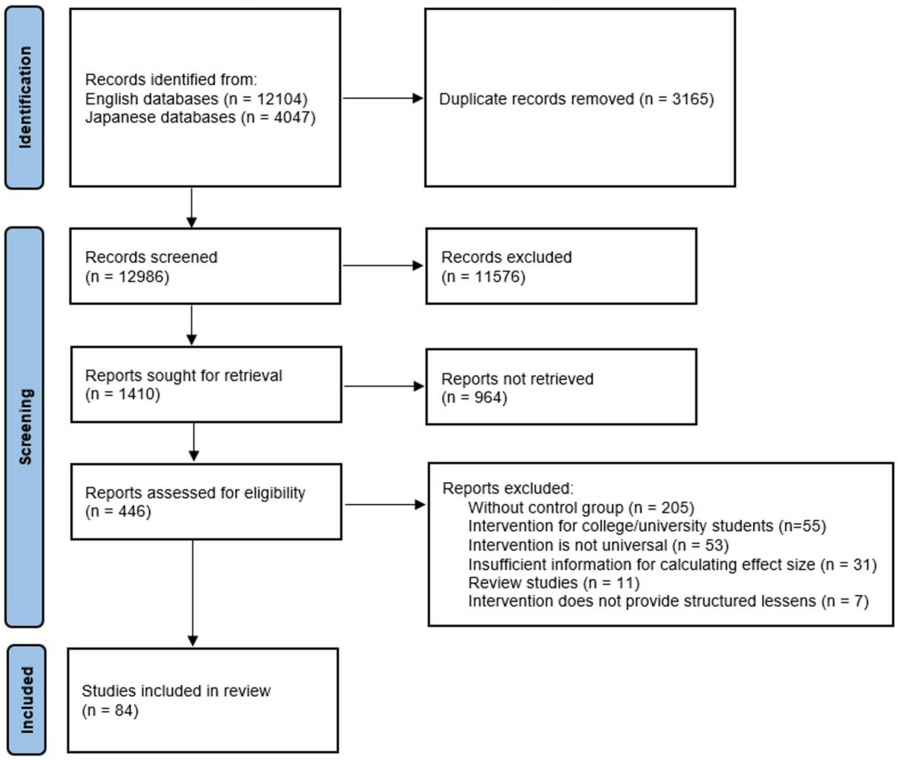

FIGURE 1
Selection process of studies included in the meta-analysis identification.

10.3389/feduc.2023.1228269

TABLE 1 Descriptive characteristics of intervention studies.

General publication features	*N*	%
Date of report		
2000–2010	36	42.9
2011–2022	49	57.1
Publication type		
Peer-reviewed journal articles published by academic societies	46	54.1
Other (journal articles published by universities, conference papers and dissertations)	41	45.9
Number of participants		
100 or less	41	48.2
101–500	36	42.4
501–1,000	4	4.7
1,001 or more	4	4.7
Mean number of participants	286.67	
The school level of participants		
Elementary school (Grades K-6)	58	68.2
Middle school (Grades 7–9)	22	25.9
High school (Grades 10–12)	5	5.9
Intervention type		
Social skills training	33	38.8
Group cognitive-behavioral therapy	17	20.0
Stress management program	11	12.9
Other	25	29.4
Facilitator		
Teacher	43	50.6
Other	42	49.4
Number of intervention sessions		
1–5	41	48.4
6–10	33	37.4
10<	5	8.8
Not reported	6	5.5
Mean number of sessions	5.57	
Frequency of intervention sessions		
Weekly or several times a week	46	54.1
Bi-weekly or three times a month	14	16.5
Monthly or bi-monthly	10	11.7
Not reported	9	10.6
Only one time intervention	6	7.1
Duration of intervention per session		
10–30 min	5	5.8
31–60 min	67	78.8
60<	2	2.4
Not reported	11	12.9
Mean duration per session	47.6 min	
Attrition rate		
5%<	30	35.3

(Continued)

TABLE 1 (Continued)

General publication features	N	%
5–10%	13	15.3
10–15%	11	12.9
15–20%	9	10.6
<20%	6	7.1
Not reported	16	18.8
Mean attrition rate	9.3%	
Quality of study		
Critical risk	4	4.7
High risk	11	12.9
Moderate risk	70	82.4
Low risk	0	0
Source of outcome data		
Child	267	83.4
Other (parents, teachers observers, and school records)	53	16.6

TABLE 2 Effect sizes of school-based social–emotional learning (SEL) programs at post-intervention.

Outcome categories	*ES*	95% CI	*k*	*Z* value	*Q* statistic	I^2 value	τ^2 Value
SE skills	0.24	(0.17–0.30)	44	7.37**	72.17**	40.42	0.01
Attitude to self and others	0.30	(0.23–0.36)	49	8.68**	121.94**	60.34	0.03
Positive social behaviors	0.31	(0.22–0.40)	29	6.76**	96.61**	71.02	0.03
Conduct problem	0.20	(0.12–0.28)	28	4.93**	46.69*	42.17	0.02
Emotional problem	0.22	(0.16–0.29)	51	6.94**	119.12**	58.02	0.02
Academic performance	1.27	(0.64–1.90)	1	3.93**	–	–	–
Grand mean	0.26	(0.22–0.30)	85	10.80**	157.23**	46.58	0.02

*$p < 0.05$, **$p < 0.01$.

promoting academic scores in math, reading, and writing. As a result, the academic performance category was excluded from further analysis.

For the grand mean, a *Q* value of 203.5 was significant, and I^2 was moderate (43.0), which suggests moderate heterogeneity among studies and the existence of one or more variables that may moderate the outcomes. For the individual outcome categories (SE skills, attitudes toward the self and others, positive social behavior, conduct problem, and emotional problem), the *Q* value was also significant (46.69–121.94), and I^2 values were moderate (40.42–71.02). This finding suggests moderate heterogeneity of effect sizes among studies and the existence of one or more variables that may moderate outcomes in these categories.

3.3. Follow-up effects of SEL programs

With the exception of the effectiveness of SEL programs on academic performance, the results addressed the research question 2: Are universal school-based SEL programs effective in improving SE skills, attitudes toward the self and others, positive social behavior, conduct problems, emotional problem, and academic performance among Japanese school-aged children at follow-up?

A total of 18 studies (20.9%) investigated the effects of interventions both at post-intervention and follow-up (see Tables 3, 4). The duration of follow-up periods in these studies ranged from 3 weeks to 2 years, with an average of 19.33 weeks. Of the 18 studies, only five conducted follow-ups for 16 weeks or longer after the intervention, while the remaining 13 studies (72.2%) implemented follow-ups for 12 weeks or less.

Among the studies that followed up, the grand mean of effect sizes at post-intervention was significant (ES = 0.17, $p < 0.01$); for SE skills (ES = 0.40, $p < 0.01$), attitude toward the self and others (ES = 0.32, $p < 0.01$), positive social behavior (ES = 0.65, $p < 0.01$), conduct problems (ES = 0.16, $p < 0.05$), and emotional problem (ES = 0.13, $p < 0.01$). The grand mean of effect sizes at follow-up was also significant (ES = 0.27, $p < 0.01$); for SE skills (ES = 0.37, $p < 0.01$), attitude toward the self and others (ES = 0.42, $p < 0.01$), positive social behavior (ES = 0.44, $p < 0.01$), and emotional problem (ES = 0.18, $p < 0.01$), but not for conduct problems. However, due to the limited number of follow-up studies, subsequent analyses were conducted only at post-intervention.

3.4. Moderators of outcomes

The results addressed the research question 3: Are there study characteristics that moderate the outcomes of universal school-based SEL programs for Japanese children?

Individual analysis of moderators identified that publication type ($B = -0.09$; $SE = 0.05$; $p < 0.05$), number of participants ($B = -0.00$; $SE = 0.00$; $p < 0.05$), and school level of children ($B = -0.07$; $SE = 0.04$; $p < 0.05$) moderated the overall effects of universal school-based SEL programs (Table 5). When these moderators were analyzed together in meta-regression, all of them remained significant and accounted for 25% ($R^2 = 0.25$) of variation in the overall effect of universal-school-based SEL programs. Publication type, number of participants, and school level of children uniquely accounted for 4, 5, and 7% of variation, respectively, in the overall effect of universal-school-based SEL programs. These findings suggest that SEL programs reported in peer-reviewed journals published by scientific societies were more effective than SEL programs reported in other publication formats, and that school-based SEL programs with smaller number of participants had higher overall effects, and that SEL programs for children in lower school level were more effective than SEL programs for children in higher school level. There was no difference in overall effects between school-based SEL programs primarily delivered by teachers and others (e.g., school counselors, researchers, and school nurses) (Table 6). There was also no difference in overall effect between SST, Group-CBT, SEL programs, stress management education and others (Table 7).

Individual analysis of moderators revealed that, among all moderators, only publication type ($B = -0.12$; $SE = 0.06$; $p < 0.05$) moderated the effectiveness of improving SE skills and accounted for 16% ($R^2 = 0.16$) variation in the effect of school-based SEL programs on SE skills. School-based SEL programs reported in peer-reviewed journals published by a scientific society were effective for promoting SE skills than school-based SEL programs reported in other publication formats (intervention reported in university press, conference papers and dissertations).

Individual analysis revealed that publication type ($B = -0.13$; $SE = 0.06$; $p < 0.05$), number of participants ($B = -0.00$; $SE = 0.00$; $p < 0.05$), and school level of children ($B = -0.13$; $SE = 0.05$; $p < 0.01$) moderated the effect of school-based SEL programs on attitude toward the self and others. However, when these moderators were analyzed together in meta-regression, only school level of children was significant and accounted for 22% ($R^2 = 0.22$) of total variation in the effect of school-based SEL programs on attitude toward self and others. School-based SEL programs reported in peer-reviewed journals published by scientific societies were effective for promoting attitude toward self and others than school-based SEL programs reported in other publication formats.

Individual analysis of moderators revealed that publication type ($B = -0.19$; $SE = 0.08$; $p < 0.05$), facilitator type ($B = 0.19$; $SE = 0.10$; $p < 0.05$), number of participants ($B = -0.00$; $SE = 0.00$; $p < 0.05$), and intervention type [$Q = 17.47$ (3); $p < 0.01$] moderated effects of school-based SEL programs on positive social behavior. When these moderators were analyzed together, only intervention type remained significant. Intervention type accounted for 52% ($R^2 = 0.52$) of variation in the effect on positive social behavior. SST was significantly more effective for promoting positive social behavior than stress management education ($B = -0.63$; $SE = 0.19$;

TABLE 3 Effect sizes of school-based SEL programs at post-intervention (only studies with follow-up).

Outcome categories	*ES*	95% CI	*k*	*z*-value	Q statistic	I^2 value	τ^2 Value
SE skills	0.40	(0.18–0.62)	8	3.50**	15.48*	54.79	0.06
Attitude to self and others	0.32	(0.20–0.44)	9	5.14**	5.43	0.00	0.00
Positive social behaviors	0.66	(0.48–0.84)	6	7.18**	6.39	21.74	0.01
Conduct problem	0.16	(0.01–0.31)	5	2.06*	2.29	0.00	0.00
Emotional problem	0.13	(0.07–0.19)	13	4.00**	7.43**	0.00	0.00
Academic performance	–	–	–	–	–	–	–
Grand mean	0.17	(0.11–0.23)	18	5.52**	15.67	0.00	0.00

*$p < 0.05$, **$p < 0.01$.

TABLE 4 Effect sizes of school-based SEL programs at follow-up.

Outcome categories	*ES*	95% CI	*k*	*Z* value	*Q* statistic	I^2 value	τ^2 Value
SE skills	0.37	(0.19–0.55)	8	3.95**	10.53	33.51	0.02
Attitude to self and others	0.45	(0.22–0.68)	8	3.85**	21.92**	68.07	0.07
Positive social behaviors	0.44	(0.21–0.68)	5	3.71**	8.04	50.27	0.04
Conduct problem	0.12	(−0.06–0.30)	5	1.30	5.33	24.90	0.01
Emotional problem	0.18	(0.07–0.29)	14	3.11**	22.56**	42.36	0.02
Academic performance	–	–	–	–	–	–	–
Grand mean	0.28	(0.14 to 0.42)	18	4.04**	58.84**	70.09	0.05

**$p < 0.01$.

10.3389/feduc.2023.1228269

TABLE 5 Results of meta-regression analyzing the moderators of effect sizes.

Moderators for each category	Analysis											
	Single moderators				All significant moderators				Only significant moderators			
All Outcomes												
Numerical variables	*B* (SE)	*Z* value	*P*-value	*k*	*B* (SE)	Z value	*P*-value	*k*	*B* (SE)	Z value	*P*-value	*k*
Publication type	−0.09 (0.05)	−1.83*	<0.05	85	−0.09 (0.04)	−2.09*	<0.05	85	−0.09 (0.04)	−2.09*	<0.05	85
Publication year	−0.01 (0.05)	−0.30	0.38	85	–	–	–	–	–	–	–	–
Facilitator	−0.03(0.05)	−0.56	0.29	85	–	–	–	–	–	–	–	–
Intervention time per session	−00(0.00)	−1.15	0.12	74	–	–	–	–	–	–	–	–
Intervention frequency	−0.01 (0.03)	−0.30	0.38	64	–	–	–	–	–	–	–	–
Intervention session number	−0.01 (0.01)	−0.27	0.40	75	–	–	–	–	–	–	–	–
Number of participants	−0.00 (0.00)	−2.04*	<0.05	85	−0.00 (0.00)	−2.09*	<0.05	85	−0.00 (0.00)	−2.09*	<0.05	85
Attrition rate	−0.00 (0.00)	−0.63	0.26	69	–	–	–	–	–	–	–	–
Rater of outcome	0.05 (0.09)	0.41	0.34	85	–	–	–	–	–	–	–	–
Study quality	0.02 (0.05)	0.73	0.23	85	–	–	–	–	–	–	–	–
School level of children	−0.07(0.04)	−1.84*	<0.05	85	−0.07 (0.04)	−2.09*	<0.05	85	−0.07 (0.04)	−2.09*	<0.05	85
Categorical variables	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*
Intervention type	1.59	(3)	0.66	85	–	–	–	–	–	–	–	–
SE skills												
Numerical variables	B (SE)	Z value	*P*-value	*k*	*B* (SE)	*Z* value	*P*-value	*k*	*B* (SE)	Z value	*P*-value	*k*
Publication type	−0.12 (0.06)	−1.98*	<0.05	44	−0.12 (0.06)	−1.98*	<0.05	44	−0.12 (0.06)	−1.98*	<0.05	44
Publication year	−0.07 (0.07)	−1.09	0.13	44	–	–	–	–	–	–	–	–
Facilitator type	0.03 (0.07)	0.51	0.31	44	–	–	–	–	–	–	–	–
Intervention time per session	−0.01 (0.03)	−1.00	0.16	40	–	–	–	–	–	–	–	–
Intervention frequency	−0.02 (0.04)	−0.45	0.32	36	–	–	–	–	–	–	–	–
Intervention session number	−0.00 (0.02)	−0.15	0.44	37	–	–	–	–	–	–	–	–
Number of participants	−0.00 (0.00)	−1.29	0.10	44	–	–	–	–	–	–	–	–
Attrition rate	−0.00 (0.00)	−1.14	0.13	35	–	–	–	–	–	–	–	–
Rater of outcome	0.10 (0.12)	0.81	0.21	44	–	–	–	–	–	–	–	–
Study quality	0.01 (0.05)	0.25	0.40	44	–	–	–	–	–	–	–	–
School level of children	−0.02 (0.05)	−0.36	0.36	44	–	–	–	–	–	–	–	–
Categorical variables	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*
Intervention type	2.50	(3)	0.48	44	–	–	–	–	–	–	–	–
Attitude toward self and others												
Numerical variables	*B* (SE)	*Z* value	*P*-value	*k*	*B* (SE)	*Z* value	*P*-value	*k*	*B* (SE)	Z value	*P*-value	*k*

(Continued)

TABLE 5 (Continued)

Moderators for each category	Analysis											
	Single moderators				All significant moderators				Only significant moderators			
Publication type	−0.13 (0.06)	−2.12*	<0.05	49	−0.10 (0.05)	−1.53	0.08	45	–	–	–	–
Publication year	−0.01 (0.07)	−0.09	0.47	49	–	–	–	–	–	–	–	–
Facilitator type	−0.05 (0.07)	−0.64	0.26	49	–	–	–	–	–	–	–	–
Intervention time per session	−0.01 (0.00)	−1.55	0.06	43	–	–	–	–	–	–	–	–
Intervention frequency	−0.05 (0.04)	−1.29	0.10	41	–	–	–	–	–	–	–	–
Intervention session number	−0.00 (0.01)	−0.35	0.36	43	–	–	–	–	–	–	–	–
Number of participants	−0.00 (0.00)	−1.79*	<0.05	49	−0.00 (0.00)	−1.43	0.06	45	–	–	–	–
Attrition rate	−0.00 (0.00)	−1.08	0.14	39	–	–	–	–	–	–	–	–
Rater of outcome	0.10 (0.12)	0.81	0.21	44	–	–	–	–	–	–	–	–
Study quality	−0.02 (0.06)	−0.35	0.36	49	–	–	–	–	–	–	–	–
School level of children	−0.13 (0.05)	−2.34**	<0.01	49	−0.12 (0.05)	−2.33*	<0.01	45	−0.13 (0.05)	−2.34**	<0.01	49
Categorical variables	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*
Intervention type	1.42	(3)	0.70	49	-	-	-	-	-	-	-	-
Positive social behavior												
Numerical variables	*B* (SE)	Z-value	*P*-value	*k*	*B* (SE)	Z value	*P*-value	*k*	*B* (SE)	Z value	*P*-value	*k*
Publication type	−0.19 (0.08)	−2.33*	<0.05	29	−0.12 (0.08)	−1.49	0.07	29	–	–	–	–
Publication year	−0.01 (0.09)	−0.63	0.26	29	–	–	–	–	–	–	–	–
Facilitator type	0.19 (0.10)	1.91*	<0.05	29	−0.01 (0.10)	−0.13	0.45	29	–	–	–	–
Intervention time per session	−0.01 (0.00)	−1.52	0.06	26	–	–	–	–	–	–	–	–
Intervention frequency	0.01 (0.06)	0.13	0.45	23	–	–	–	–	–	–	–	–
Intervention session number	0.00 (0.02)	0.89	0.19	24	–	–	–	–	–	–	–	–
Number of participants	−0.00 (0.00)	−1.69*	<0.05	29	−0.00 (0.00)	−1.09	0.14	29	–	–	–	–
Attrition rate	0.00 (0.01)	0.55	0.29	21	–	–	–	–	–	–	–	–
Rater of outcome	−0.01(0.12)	−0.65	0.26	29	–	–	–	–	–	–	–	–
Study quality	−0.00 (0.09)	−0.05	0.48	29	–	–	–	–	–	–	–	–
School level of children	−0.04 (0.09)	−0.37	0.36	29	–	–	–	–	–	–	–	–
Categorical variables	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*
Intervention type	17.47**	(3)	<0.01	29	12.19**	(3)	<0.01	29	17.47**	(3)	<0.01	29
Conduct problem												
Numerical variables	*B* (SE)	Z value	*P*-value	*k*	*B* (SE)	*Z* value	*P*-value	*k*	*B* (SE)	Z value	*P*-value	*k*
Publication type	−0.13 (0.09)	−0.38	0.35	28	–	–	–	–	–	–	–	–

(Continued)

TABLE 5 (Continued)

Moderators for each category	Analysis											
	Single moderators				All significant moderators				Only significant moderators			
Publication year	−0.04 (0.09)	−0.43	0.33	28	–	–	–	–	–	–	–	–
Facilitator type	−0.05 (0.08)	−0.56	0.29	28	–	–	–	–	–	–	–	–
Intervention time per session	0.00 (0.00)	1.09	0.13	24	–	–	–	–	–	–	–	–
Intervention frequency	−0.00 (0.07)	−0.06	0.48	24	–	–	–	–	–	–	–	–
Intervention session number	−0.01 (0.01)	−0.13	0.13	27	–	–	–	–	–	–	–	–
Number of participants	−0.00 (0.00)	−2.59*	<0.01	28	−0.00 (0.00)	−2.59**	<0.01	28	−0.00 (0.00)	−2.59*	<0.01	28
Attrition rate	−0.00 (0.00)	−0.56	0.28	24	–	–	–	–	–	–	–	–
Rater of outcome	0.10 (0.12)	0.81	0.21	28	–	–	–	–	–	–	–	–
Study quality	−0.06 (0.07)	−0.89	0.19	28	–	–	–	–	–	–	–	–
School level of children	−0.01 (0.07)	−0.09	0.47	28	–	–	–	–	–	–	–	–
Categorical variables	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*
Intervention type	1.51	(3)	0.68	28	–	–	–	–	–	–	–	–
Emotional problem												
Numerical variables	*B* (SE)	Z value	*P*-value	*k*	*B* (SE)	Z value	*P-0*value	*k*	*B* (SE)	Z value	*P*-value	*k*
Publication type	−0.08 (0.06)	−1.22	0.11	51	–	–	–	–	–	–	–	–
Publication year	−0.11 (0.07)	−1.58	0.06	51	–	–	–	–	–	–	–	–
Facilitator type	−0.00 (0.06)	−0.02	0.49	51	–	–	–	–	–	–	–	–
Intervention time per session	−0.00 (0.00)	−0.62	0.27	41	–	–	–	–	–	–	–	–
Intervention frequency	−0.03 (0.05)	−0.68	0.25	40	–	–	–	–	–	–	–	–
Intervention session number	−0.00 (0.01)	−0.01	0.49	47	–	–	–	–	–	–	–	–
Number of participants	−0.00 (0.00)	−2.66**	<0.01	51	−0.00 (0.00)	−1.50	0.07	51	–	–	–	–
Attrition rate	−0.00 (0.00)	−0.24	0.40	39	–	–	–	–	–	–	–	–
Rater of outcome	−0.07 (0.12)	−0.55	0.29	51	–	–	–	–	–	–	–	–
Study quality	0.01 (0.07)	0.14	0.45	51	–	–	–	–	–	–	–	–
School level of children	−0.09 (0.06)	−1.71*	<0.05	51	−0.10 (0.06)	−1.77*	<0.05	51	−0.09 (0.06)	−1.71*	<0.05	51
Categorical variables	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*-value	*k*	*Q* value	(df)	*P*- value	*k*
Intervention type	2.49	(3)	0.48	51	–	–	–	–	–	–	–	–

*$p < 0.05$, **$p < 0.01$.

$p < 0.01$) and others ($B = -0.35$; $SE = 0.11$; $p < 0.01$). CBT was significantly more effective in promoting positive social behavior than stress management education ($B = -0.47$; $SE = 0.18$; $p < 0.01$) and others ($B = -0.18$; $SE = 0.09$; $p < 0.05$). Others was more effective for promoting positive social behavior than stress management education ($B = -0.27$; $SE = 0.17$; $p < 0.05$). There was no difference in the effectiveness of SST and CBT for promoting positive social behavior.

Individual analysis of moderators identified that only number of participants moderated the effect of school-based SEL programs on conduct problem ($B = -0.00$; $SE = 0.00$; $p < 0.01$) and accounted for 44% ($R^2 = 0.44$) of variation in the effect of SEL programs on conduct

TABLE 6 Effect sizes of school-based SEL programs delivered by teachers and others.

	SE skills			Attitude to self and others			Positive social behaviors			Conduct problem			Emotional problem			Grand mean		
Intervention leader	ES	95% CI	*k*	ES	95% CI	*k*	ES	95% CI	*k*	ES	95% CI	*k*	ES	95% CI	*k*	ES	95% CI	*k*
Teachers	0.22**	(0.14–0.29)	23	0.31**	(0.23–0.40)	28	0.26**	(0.16–0.36)	19	0.22**	(0.08–0.27)	14	0.23**	(0.15–0.33)	23	0.28**	(0.21–0.34)	43
Others	0.27**	(0.15–0.38)	21	0.27**	(0.16–0.39)	21	0.44**	(0.14–0.54)	10	0.18**	(0.06–0.30)	14	0.22**	(0.15–0.29)	28	0.25**	(0.18–0.32)	42

**$p < 0.01$.

TABLE 7 Effect sizes of different types of school-based SEL programs at post-intervention.

	SE skills			Attitude to self and others			Positive social behaviors			Conduct problem			Emotional problem			Grand mean		
Intervention type	*ES*	95% CI	k	*ES*	95% CI	k	*ES*	95% CI	k	*ES*	95% CI	k	*ES*	95% CI	k	*ES*	95% CI	k
SST	0.29**	(0.18 to 0.40)	20	0.28**	(0.15 to 0.40)	21	0.59**	(0.37 to 0.81)	6	0.19**	(0.06 to 0.32)	16	0.26**	(0.14 to 0.39)	17	0.24**	(0.15 to 0.34)	33
CBT	0.36**	(0.07 to 0.65)	6	0.34**	(0.23 to 0.44)	8	0.41**	(0.25 to 0.57)	6	0.13	(−0.18 to 0.43)	1	0.14**	(0.08 to 0.20)	12	0.21**	(0.14 to 0.27)	18
SME	0.17*	(0.02 to 0.32)	6	0.10	(−0.27 to 0.47)	1	−0.13	(−65 to 0.40)	3	0.29**	(0.15 to 0.43)	5	0.28**	(0.17 to 0.39)	11	0.26**	(0.15 to 0.37)	11
Others	0.17**	(0.10 to 0.23)	13	0.31**	(0.21 to 0.41)	19	0.22**	(0.13 to 0.30)	14	0.17**	(0.05 to 0.30)	6	0.20**	(0.05 to 0.35)	11	0.30**	(0.21 to 0.39)	24

*$p < 0.05$, **$p < 0.01$. SME, stress management education.

problem. Individual analysis of moderators identified that number of participants ($B = -0.00$; $SE = 0.00$; $p < 0.01$) and school level of children ($B = -0.09$; $SE = 0.06$; $p < 0.05$) and moderated the effect of SEL programs on emotional problem. When these moderators were analyzed together in meta-regression, only school level of children remained significant and accounted for 47% ($R^2 = 0.47$) of total variance in effect of SEL programs on emotional problem.

3.5. Publication bias

The observation of funnel plots (Supplementary Appendix B) and the results of Egger's regression test indicated potential publication bias in overall effect [intercept = 0.87; $t(83) = 3.48$; $p < 0.01$], SE skills [intercept = 0.74; $t(42) = 2.40$; $p < 0.01$], attitude toward the self and others [intercept = 1.31; $t(47) = 3.57$; $p < 0.01$], positive social behavior [intercept = 1.57; $t(27) = 3.01$; $p < 0.01$], conduct problem [intercept = 1.73: $t(26) = 3.21$; $p < 0.01$], and emotional problem [intercept = 1.39; $t(49) = 4.46$; $p < 0.01$]. The trim-and-fill method (Duval and Tweedie, 2000) indicated that the adjusted effect sizes after omitting publication bias may be slightly higher for overall effect (adjusted ES = 0.29) and emotional problem (adjusted ES = 0.23) and slightly lower for attitude toward the self and others (adjusted *ES* = 0.21), and positive social behavior (adjusted ES = 0.30), conduct problem (adjusted ES = 0.12). The adjusted effect size was close for SE skills (adjusted ES = 0.24), Adjusted effect size remain significantly different from zero for all outcome categories.

4. Discussion

4.1. Immediate effects of universal school-based SEL programs

The present meta-analysis effectively addressed the research question 1 except for the effectiveness of SEL programs on academic performance. The present meta-analysis contributes evidence supporting the effectiveness of universal school-based SEL programs in promoting various outcomes among Japanese children, including SE skills, attitude toward self and others, conduct problems, and emotional problems. The overall effect size at post-intervention was found to be 0.26, with effect sizes for specific outcome categories ranging from 0.20 to 0.31. These findings suggest that universal school-based SEL programs have a small but significant immediate effect in improving the targeted areas among Japanese children. It is noteworthy that despite socio-cultural differences, the effect sizes observed in this meta-analysis are comparable to those reported in meta-analyses conducted in Western contexts (as shown in Table 8).

This similarity can be attributed to the fact that many of the SEL programs implemented in Japan have been adapted from Western models, such as SST, Group CBT, and stress management education, to better suit the specific needs of Japanese children and the school environment (Matsumoto and Shimizu, 2016; Harada and Watanabe, 2021).

The present meta-analysis holds significant implications for enhancing the mental health of Japanese children. The results underscore the immediate effectiveness of universal school-based SEL programs in fostering SE skills, positive attitude toward self and others, positive social behaviors, and mitigating conduct and emotional problems. Therefore, expanding the implementation of these programs across Japanese schools could contribute to improved mental health outcomes among children. Although the present meta-analysis did not establish the immediate effectiveness of SEL programs on academic performance, previous research has consistently shown that children's mental health plays a significant role in predicting long-term outcomes, including academic achievement, physical health, and socioeconomic status in adulthood (Gibbons and Silva, 2011; Bücker et al., 2018). Therefore, expanding the implementation of SEL programs may also have the potential to indirectly influence these crucial long-term outcomes, resulting in improved academic achievement, positive physical health, and enhanced socioeconomic status for children as they progress into adulthood.

Given the limited availability of school counselors in Japan, teachers would play a crucial role in delivering these programs (MEXT, 2021). To effectively promote mental health among Japanese children, it is essential to prioritize teacher training in universal school-based SEL programs as part of both pre-service teacher education and ongoing professional development. This investment would equip teachers with the necessary knowledge and skills to effectively implement these programs, enabling them to have a positive impact on the mental health of Japanese children.

However, the present meta-analysis reveals small effect sizes for universal school-based SEL programs, suggesting that implementing these programs alone may not lead to substantial improvements in children's SE skills, attitudes toward self and others, social behavior, and conduct and emotional problems. International studies have increasingly shown that school-based interventions that involve community components, such as parental and local agency support, are more effective compared to interventions without community involvement (Goldberg et al., 2019). Therefore, to effectively promote children's SE skills, attitudes, positive social behavior, and reduce conduct and emotional problems in the future, enhancing collaboration between families and teachers is crucial. This could include implementing parental training programs aimed at promoting children's SE skills, in addition to delivering universal school-based SEL programs (Ikesako and Miyamoto, 2015). Improving collaboration between schools, families, and community mental health professionals can be facilitated by providing mental health literacy training to parents and addressing the stigma attached to mental health problems. Currently, parental stigma acts as a barrier to their children accessing community mental health professionals and limits collaboration between schools, families, and community mental health professionals (Yamaguchi et al., 2020).

4.2. Follow-up effects of school-based SEL programs

The present meta-analysis addressed the research question 2 except for the effectiveness of SEL programs on academic performance at follow-up. The present meta-analysis examined both post-intervention and follow-up effects of school-based SEL programs and found that children who received these programs demonstrated higher SE skills, improved attitudes toward self and others, and displayed positive social behaviors at follow-up, while also experiencing lower emotional problems. The average follow-up period in the analyzed Japanese studies was 19.3 weeks after the intervention. These findings indicate that universal school-based SEL programs have a sustainable effect on promoting SE skills, improving attitudes, fostering positive social behaviors, and enhancing emotional well-being for at least 4–5 months after program implementation. This reinforces the notion that increasing the adoption of universal

TABLE 8 Comparison of effect sizes between the present meta-analysis and past meta-analysis in the Western context.

	Outcome categories					
First author and year of publication	SE skills	Attitudes toward self and others	Positive social behaviors	Conduct problem	Emotional problem	Academic performance
Present analysis	0.24	0.30	0.31	0.20	0.22	–
Haney and Durlak, 1998	–	0.09	–	–	0.21	0.29
Wilson and Lipsey, 2007	–	-	0.37	0.28	0.24	–
Durlak et al., 2011	0.57	0.23	0.24	0.22	0.24	0.27
Korpershoek et al., 2016	–	–	–	0.24	–	0.17
Boncu et al., 2017	0.36	0.19	–	0.37	0.17	–
Taylor et al., 2017	0.17	0.17	0.06	0.07	0.12	0.22
Corcoran et al., 2018	–	–	–	–	–	0.19–0.26
van de Sande et al., 2019	0.24–0.58	–	–	0.33	0.27–0.31	–
Sklad et al., 2012	0.70	0.46	0.39	0.43	0.19	0.46
Wigelsworth et al., 2016	0.31	0.21	0.37	0.34	0.24	0.38

TABLE 9 Comparison of effect size at follow-up between the present meta-analysis and meta-analysis in the Western context.

	Outcome categories					
Authors and year of publication	SE skills	Attitudes	Positive social behaviors	Conduct problems	Emotional problem	Academic performance
Present analysis	0.37	0.45	0.44	0.12	0.18	–
Durlak et al., 2011	0.26	0.11	0.17	0.14	0.15	0.32
Taylor et al., 2017	0.23	0.13	0.13	0.14	0.16	0.33
Sklad et al., 2012	0.07	0.07	0.12	0.20	0.10	0.26

school-based SEL programs among Japanese schools will be beneficial for effectively promoting SE skills, positive social behaviors, and reducing emotional problems among Japanese children.

However, due to the limited follow-up period of the Japanese studies included in the present meta-analysis ($M = 19.3$ weeks after the intervention), it was not possible to investigate whether universal school based SEL programs have a sustainable long-term effect (e.g., 1 year) on Japanese children. Such long-term improvements in SE skills, attitude toward self and others, social behavior, and mental health are crucial for children's long-term outcomes, including academic achievement, physical health, and socioeconomic status in adulthood (Gibbons and Silva, 2011; Bücker et al., 2018). Furthermore, the effect size for promoting emotional problems at follow-up was small, and there was no significant effect on promoting conduct problems at follow-up. These findings further emphasize the implication that relying solely on universal school based SEL programs may not be enough to achieve substantial and lasting improvements in children's emotional and conduct problems over the long term. Therefore, it becomes imperative for Japanese schools to consider implementing school-based interventions that incorporate community components, including support from parents and local agencies. As evidenced by international studies (Goldberg et al., 2019), such interventions have been found to be more effective than solely implementing universal school based SEL programs.

The effect sizes of SEL programs at follow-up appear to be mostly similar to or higher than those found in previous meta-analyses conducted in Western contexts (Table 9). However, it is important to note that while the present meta-analysis included studies that investigated follow-up effects of any duration, Durlak et al. (2011) and Taylor et al. (2017) calculated effect sizes by only including studies that conducted follow-up for 6 months or longer. Similarly, Sklad et al. (2012) calculated effect sizes by only including studies that followed up for 7 months or longer. Therefore, the results of the present meta-analysis and previous meta-analyses in western context may not be directly comparable.

4.3. Study characteristics that influence the outcomes of school-based SEL programs

In response to the research question 3, the present meta-analysis found that there are study characteristics that moderate the outcomes of school-based SEL programs for Japanese children. The present meta-analysis aligns with previous meta-analyses conducted in Western contexts (Wilson and Lipsey, 2007; Korpershoek et al., 2016) by finding that school-based SEL programs in Japan are more effective for younger children in lower school levels, particularly in promoting attitude toward self and others and reducing emotional problems. This pattern of effectiveness can be attributed to the greater plasticity of the brains of younger children, allowing for more efficient consolidation of new learning compared to older children (Frank et al., 2022). The moderating effect of school level underscores the critical importance of early intervention, highlighting the need to provide universal school-based SEL programs to younger children in order to effectively promote positive changes in their lives. However, the findings also indicate the need to explore strategies that can enhance the effectiveness of SEL programs for older children in higher school levels. Further research is necessary to understand how SEL programs can be tailored to address the unique developmental needs and challenges of older students, ensuring that they too benefit from these programs and experience positive changes in their SE skills and mental health.

Previous meta-analyses of Japanese studies (Takahashi and Koseki, 2011; Morita et al., 2015) and those conducted in the Western context (Durlak et al., 2011; Taylor et al., 2017) did not investigate the moderating impact of the number of participants. However, the present meta-analysis found that school based SEL programs may be more effective when delivered to a smaller number of children. These findings may be attributed to the fact that it is more feasible to deliver SEL programs as intended to a smaller number of children compared to a larger number. For instance, delivering SEL programs to a larger number of children often requires training a larger number of teachers to deliver SEL programs in their own classrooms. It is more challenging to train a larger number of teachers to have sufficient competencies in delivering an SEL program. This difficulty arises from the greater challenge of providing adequate support to each individual teacher. Additionally, securing adequate staffing for delivering SEL programs as intended can be more challenging when delivering to a larger number of children, especially in Japan where schools are facing staff shortages (Fujimura and Mistilina, 2020). Therefore, delivering SEL programs to smaller groups of children may be more practical and effective for producing positive outcomes.

However, it is important to scale up the delivery of SEL programs to reach a larger number of children and have a positive impact on society as a whole. The challenges of delivering SEL programs to a large number of children could be partly addressed by the integration of ICT into the delivery of SEL programs. Currently, the delivery of SEL programs in Japan still heavily relies on paper and pencil. However, there is increasing evidence from international studies that mobile apps can be effective for delivering SEL programs to children (Wang et al., 2018). The use of mobile apps could potentially reduce the workload for program facilitators of SEL programs and help

schools deliver SEL programs to a larger number of children more efficiently. Furthermore, while training a large number of Japanese school teachers to deliver school-based SEL programs with equal competency is challenging, teachers may develop better skills in delivering these programs and promoting SE skills, attitude, behavior, and mental health among children over time as they gain experience delivering SEL programs, which may help address the challenge of scaling up the delivery of SEL programs in Japan (Zhan et al., 2018).

The present meta-analysis found differences in the effectiveness of promoting positive social behavior among different types of SEL programs. Specifically, SST and CBT were found to be more effective than stress management education, while others were more effective than stress management education for promoting positive social behavior. These findings may be attributed to the content of stress management programs, which primarily focus on SE skills related to stress management, such as self-awareness and self-management, and have less emphasis on SE skills related to social behaviors such as social awareness and relationship skills. In contrast, SST and CBT commonly focus on training both stress management and social behaviors (Tanaka et al., 2014; Yamamoto et al., 2017). These results suggest that for effective promotion of positive social behavior among children, schools may find the implementation of SST, CBT, and other programs more useful than stress management education.

Prior meta-analyses in Western contexts have explored the variation in effect sizes of Social–Emotional Learning (SEL) programs between published and unpublished studies (Durlak et al., 2011; Taylor et al., 2017). However, these meta-analyses did not specifically investigate the impact of different publication formats on the effects of universal school-based SEL programs, such as peer-reviewed journal articles published by scientific societies, conference papers, and dissertations. This present meta-analysis offers a unique perspective by revealing that SEL programs published in peer-reviewed journal articles from academic societies may have a greater effectiveness for Japanese children compared to programs published in other formats, such as university/college journals, conference proceedings, and dissertations. These findings can be partially attributed to publication bias, where researchers are more inclined to report interventions with successful outcomes in peer-reviewed journals compared to other publication formats. This bias may arise because Japanese journals published by universities/colleges, Japanese conference proceedings, and Japanese dissertations often have limited peer-review processes for publication. In fact, peer-reviewed journals are three times more likely to reject submitted manuscripts lacking a report on statistically significant intervention effects (Mlinarić et al., 2017). It is important to note that while the effectiveness of SEL programs published in peer-reviewed journal articles by scientific societies may still be significant, the presence of publication bias indicates that these findings may not fully represent the real-life effectiveness of such programs for Japanese children. Therefore, cautious analysis and interpretation of the results are warranted.

According to previous meta-analyses conducted in a Western context, teacher-delivered social–emotional learning (SEL) programs are more effective than those delivered by external mental health professionals and researchers (Durlak et al., 2011). However, the present meta-analysis indicates that there is no difference in the effectiveness of school based SEL programs primarily delivered by Japanese teachers and other professionals, such as school counselors and mental health professionals. This finding may be attributed, in part, to the fact that SEL programs are less recognized by the Japanese educational system, and many Japanese teachers have limited experience and knowledge in delivering SEL programs (MEXT, 2020). The majority of Japanese teachers who participated in the selected studies were delivering SEL programs for the first time, implying that their effectiveness may increase as they gain experience and effectively integrate SEL programs into their daily routines. Considering that the present findings suggest that teacher-delivered SEL programs may be as effective as those delivered by external professionals, it may not be necessary for schools to seek out external professionals for the effective delivery of SEL programs to children.

Consistent with some previous meta-analyses (van de Sande et al., 2019), the present meta-analysis suggests that the number of sessions and time per session may not moderate the outcomes of SEL programs. These findings suggest that a brief SEL program with a shorter time per session and fewer sessions may be capable of producing positive effects on children, at least immediately after completing the program. However, the present meta-analysis was unable to determine whether a brief SEL program has a sustainable effect on promoting SE skills, behavior, and mental health of children over the long-term (e.g., 1-year follow-up). Therefore, the findings from the present meta-analysis are insufficient to confirm whether a brief SEL program is a viable option for promoting children's SE skills, attitudes toward self and others, positive social behavior, conduct problems, and emotional problems over the long-term.

The present meta-analysis aligns with previous studies (Durlak et al., 2011) by suggesting that study quality and publication year do not moderate the effectiveness of social–emotional learning (SEL) programs in Japan. However, in contrast to previous meta-analyses conducted in Western contexts (Wilson and Lipsey, 2007), the present study found no moderation effect of attrition rate on the outcomes of universal school-based SEL programs in Japan. Nevertheless, this finding may be influenced by poor reporting of attrition rates in some included studies, with 18.8% of studies lacking attrition rate information. Therefore, the evaluation of the moderating effect of attrition rate on the outcomes of SEL programs in Japan in this meta-analysis may be uncertain. Moreover, contrary to previous meta-analyses (Korpershoek et al., 2016) that reported higher effectiveness ratings from parents, teachers, and other observers compared to students, the present study did not find a moderation effect of the type of rater (child or others) on the outcomes of SEL programs in Japan. However, as only a small percentage of studies (4.7%, k = 4) reported teacher-rated effectiveness of SEL programs, it remains unclear whether the meta-analysis accurately assessed differences in effectiveness ratings between children and other raters.

4.4. Limitations

In contrast to previous meta-analyses conducted in Western contexts (Wilson and Lipsey, 2007; Korpershoek et al., 2016), the present meta-analysis did not include any studies that employed a cluster-randomized controlled trial design. Furthermore, a number of studies ($k = 31$) were excluded due to insufficient information to calculate effect sizes, often presenting results graphically without providing precise numerical data. These limitations raise concerns about the potential bias in the effectiveness of the programs found in this meta-analysis. In addition, it is important to acknowledge that this meta-analysis exclusively incorporated published studies, which introduces the potential for publication bias. The analysis revealed the presence of potential

publication bias in both the overall effect size and effect size across all outcome categories. Consequently, it is possible that the effect sizes calculated in the present study may differ from the actual effect sizes. Additionally, the limited number of studies targeting preschool students ($k=1$) and high school students ($k=5$) restricts the generalizability of the findings to these specific age groups. Moreover, the inclusion of only a small number of studies examining follow-up effects ($k=18$), with only five studies conducting follow-up for 12 weeks or longer, prevents a conclusive determination of the long-term effects of SEL programs (e.g., 6 months or longer). Furthermore, due to the inclusion criterion being met by only one study, the meta-analysis could not synthesize evidence on the effectiveness of programs in promoting academic performance. The present meta-analysis was restricted to studies that met specific criteria, including being published in English or Japanese and listed in major databases. As a result, unpublished studies, studies published in languages other than English or Japanese, and studies not listed in major databases were not included in the analysis. Consequently, it is important to acknowledge that the results may not fully represent the findings of all published and unpublished studies.

5. Conclusion

The present meta-analysis offers new insights into the immediate effects of universal school based SEL programs on SE skills, attitudes to self and others, social behavior, emotional problem, and conduct problem among Japanese children aged 5–18. It highlights the need for increased funding in universal school based SEL programs to enhance SE skills and promote mental health in Japanese children. However, the small effect sizes observed in this meta-analysis suggest a need for further research to explore strategies for generating larger effects. Collaboration between schools, parents, and local agencies could be an approach to consider, alongside school-based SEL programs. Additionally, future studies should investigate how SEL programs can be effectively delivered to a larger number of children, with potential avenues such as mobile apps warranting exploration to expand program reach.

To validate the effectiveness of universal school based SEL programs, large-scale cluster-randomized controlled trials randomizing classes and schools into intervention and control groups are crucial. These trials would yield more robust evidence with reduced biases. Additionally, further studies are needed to examine the long-term effects of school based SEL programs, focusing on durations of 6 months or more. A greater number of studies is necessary to consolidate evidence on the effectiveness of SEL programs for preschool and high school students. Moreover, investigating the impact of school based SEL programs on academic performance among Japanese children is vital. Specifically, exploring the link between SEL programs and academic outcomes may garner stronger interest from the Japanese government, potentially leading to increased implementation of SEL programs throughout Japanese schools.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

YT conducted study planning, data collection, data analysis, and production of a manuscript. MB, YM, YI, and SE were involved in revising the manuscript and providing suggestions for data analysis. All authors contributed to the article and approved the submitted version.

Acknowledgments

The authors would like to thank the researchers who conducted the selected studies and the school children and teachers who participated in such studies.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2023.1228269/full#supplementary-material

References

References marked with an asterisk indicate studies included in the meta-analysis.

*Ando, M., Asakura, T., Ando, S., and Simons-Morton, B. (2007). A psychoeducational program to prevent aggressive behavior among Japanese early adolescents. *Health Educ. Behav.*, 34, 765–776 doi: 10.1177/1090198106291965

Boncu, A., Costea, I., and Minulescu, M. (2017). A meta-analytic study investigating the efficiency of socio-emotional learning programs on the development of children and adolescents. *Romanian Journal of Applied Psychology*, 19, 35–41.

Borenstein, M., Hedges, L., Higgins, J., and Rothstein, H. (2013). *Comprehensive Meta-analysis version 3*. Englewood, NJ: Biostat.

Bücker, S., Nuraydin, S., Simonsmeier, B. A., Schneider, M., and Luhmann, M. (2018). Subjective well-being and academic achievement: a meta-analysis. *J. Res. Pers.* 74, 83–94. doi: 10.1016/j.jrp.2018.02.007

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences. 2nd* Edn Routledge doi: 10.4324/9780203771587

Corcoran, R. P., Cheung, A. C. K., Kim, E., and Xie, C. (2018). Effective universal school-based social and emotional learning programs for improving academic achievement: A systematic review and meta-analysis of 50 years of research. *Educational Research Review*, 25, 56–72 doi: 10.1016/j.edurev.2017.12.001

de Mooij, B., Fekkes, M., Scholte, R. H. J., and Overbeek, G. (2020). Effective components of social skills training programs for children and adolescents in nonclinical samples: A multilevel meta-analysis. *Clinical Child and Family Psychology Review* 23, 250–264. doi: 10.1007/s10567-019-00308-x

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a Meta-analysis of school-based universal interventions. *Child Dev.* 82, 405–432. doi: 10.1111/j.1467-8624.2010.01564.x

Duval, S., and Tweedie, R. (2000). Trim and Fill: A simple funnel-plot–based method of testing and adjusting for publication bias in meta-analysis. *Biometrics* 56, 455–463. doi: 10.1111/j.0006-341X.2000.00455.x

*Ebata, S. (2019). Effects of school-based social skills training by a homeroom teacher. *Bullet Chukyo Junior College*, 49, 13–18. doi: 10.20732/00000149

*Ebata, S., and Kamimura, E. (2018). The effects of school-based cognitive psychological education and social skills training on feeling for friends among junior high school students. *Stress Sci Res*, 33, 32–39 doi: 10.5058/stresskagakukenkyu.2018001

Einfeld, S. L., Beaumont, R., Clark, T., Clarke, K. S., Costley, D., Gray, K. M., et al. (2018). School-based social skills training for young people with autism spectrum disorders. *Journal of Intellectual & Developmental Disability* 43, 29–39. doi: 10.3109/13668250.2017.1326587

Frank, S. M., Becker, M., Qi, A., Geiger, P., Frank, U. I., Rosedahl, L. A., et al. (2022). Efficient learning in children with rapid GABA boosting during and after training. *Current Biology* 32, 5022–5030. doi: 10.1016/j.cub.2022.10.021

*Fujieda, S., and Aikawa, A. (2001). Classwide social skills training: elementary school. *Jpn. J. Educ. Psychol.*, 49, 371–381 doi: 10.5926/jjep1953.49.3_371

Fujimura, Y., and Mistilina, S. (2020). How Japanese education boards frame teacher education as a training, learning, and policy problem. *Journal of Education for Teaching* 46, 20–35. doi: 10.1080/02607476.2019.1708625

*Fujiwara, Y. (2018). 不登校予防のための児童のレジリエンス向上-SEL-8S による社会的能力の向上を通して [the promotion of student resilience for the prevention of school refusals-through social skills development by SEL-8S]. *Bullet. Univ. Teach. Educ.*, 8, 89–96. Available at: http://hdl.handle.net/10780/2056

Gibbons, S., and Silva, O. (2011). School quality, child wellbeing and parents' satisfaction. *Econ. Educ. Rev.* 30, 312–331. doi: 10.1016/j.econedurev.2010.11.001

Goldberg, J. M., Sklad, M., Elfrink, T. R., Schreurs, K. M. G., Bohlmeijer, E. T., and Clarke, A. M. (2019). Effectiveness of interventions adopting a whole school approach to enhancing social and emotional development: A meta-analysis. *European Journal of Psychology of Education* 34, 755–782. doi: 10.1007/s10212-018-0406-9

*Goto, Y., Matsuda, J., Sato, H., and Sato, S. (2009). Group social skills training for children: one-year follow-up study. *J Res Center Educ Pract*, 17, 137–149. Available at: https://cir.nii.ac.jp/crid/1520572359125379712

*Goto, Y., Sato, S., and Sato, Y. (2000). Classroom-based social skills training with grade school children. *Japanese J Behav Ther*, 26, 15–24. doi: 10.24468/jjbt.26.1_15

*Goto, Y., Sato, S., and Takayama, I. (2001). 児童に対する集団社会的スキル訓練の効果[the effectiveness of social skills training for children]. *Japan. J. Counsel. Sci.*, 34, 127–135. Available at: https://cir.nii.ac.jp/crid/1520290884686694016

Graham, A., Phelps, R., Maddison, C., and Fitzgerald, R. (2011). Supporting children's mental health in schools: teacher views. *Teach. Teach.* 17, 479–496. doi: 10.1080/13540602.2011.580525

*Hagiwara, M., Uehara, K., and Sato, Y. (2012). A study on the effects of class-based social skills training. *J. Res. Center Educ. Pract.*, 20, 93–100. Available at: http://hdl.handle.net/10458/3661

Haney, P., and Durlak, J. A. (1998). Changing self-esteem in children and adolescents: a meta-analytical review. *J. Clin. Child Psychol.*, 27, 423–433. doi: 10.1207/s15374424jccp2704_6

*Hara, I., and Furuta, M. (2016). Effect of health guidance which promotes self-understanding on resilience in schoolchildren. *Educ. Sci.*, 65, 53–59. Available at: http://hdl.handle.net/10424/6516

*Harada, E., and Watanabe, Y. (2021). Effects of social and emotional learning on the social skills and resilience of Japanese high school students. *Stud Educ Pract*, 24, 1–14. doi: 10.50841/kyoikujissen.24.0_1

Hetrick, S. E., Cox, G. R., Witt, K. G., Bir, J. J., and Merry, S. N. (2016). Cognitive behavioural therapy (CBT), third-wave CBT and interpersonal therapy (IPT) based interventions for preventing depression in children and adolescents. *Cochrane Database of Systematic Reviews* 8, 1–301. doi: 10.1002/14651858.CD003380.pub4

*Hirooka, M., and Hirooka, S. (2004). The effects of the classroom-based assertion training on junior high school students' communication competence: practical research in the classroom, *Educ. Sci.*, 55, 75–90. Available at: http://hdl.handle.net/10076/2096

*Hori, A., Shimada, H., and Sasaki, K. (2004). 学級単位による集団社会的スキル訓練のストレス反応軽減効果[the effectiveness of classroom-based group social skills training for reducing the stress level]. *J. Hum. Dev. Clin. Psychol.*, 10, 25–32.

*Hosoda, S., and Miura, M. (2012). 高校生を対象としたソーシャルスキル教育の実践と効果の検討一傾聴スキルに焦点をあてて一[investigating the practice and effectiveness of social skills training for senior high school students-focusing on active listening skills]. *Ann. Convent. Japan. Assoc. Educ. Psychol.*, 54:762. doi: 10.20587/pamjaep.54.0_762

Ikesako, H., and Miyamoto, K. (2015). Fostering social and emotional skills through families, schools and communities: Summary of international evidence and implication for Japan's educational practices and research (OECD Publishing). *OECD Education Working Papers* 121, 1–75. doi: 10.1787/5js07529lwf0-en

*Ishikawa, S.-I., Iwanaga, M., Yamashita, B., Sato, H., and Sato, S. (2010). Long-term effects of social skills training on depressive symptoms in children. *Jpn. J. Educ. Psychol.*, 58, 372–384 doi: 10.5926/jjep.58.372

*Kadono, A., and Tominaga, Y. (2009). Bullying prevention education using stress management in an elementary education. *Stress Manage. Res.*, 5, 21–26. Available at: https://plaza.umin.ac.jp/jssm-since2002/bkno/

*Kagawa, M., and Koizumi, R. (2006). A pilot study of social and emotional learning program for third-and forth-grade children. *Bullet. Fukuoka Univ. Educ. Part IV Educ. Psychol.*, 55, 147–156. Available at: http://hdl.handle.net/10780/85

*Kagawa, M., and Koizumi, R. (2007). Effects of a social and emotional learning program on elementary school children. *Bullet. Fukuoka Univ. Educ. Part IV Educ. Psychol.*, 56, 63–71. Available at: http://hdl.handle.net/10780/121

*Kagawa, T., and Koizumi, R. (2013). Effects of improving children's social and emotional competence on motivation to learn: a trial implementation of SEL-8S program for second graders. *Bullet. Res Guidance Center Teach.*, 21, 259–266. Available at: https://cir.nii.ac.jp/crid/1520572357871961344

*Kaibai, E., and Sato, S. (2000). Effect of classroom-based social skills training on children's withdrawn behavior. *Ann. Convent. Japan. Assoc. Educ. Psychol.*, 42:412. doi: 10.20587/pamjaep.42.0_412

*Kanayama, M., Goto, Y., and Sato, S. (2000). The effect of classroom-based social skills training on elementary school Children's loneliness. *Japan. J. Behav. Therapy*, 26, 83–96. doi: 10.24468/jjbt.26.2_83

*Kato, S., and Shimizu, E. (2017). A pilot study on the effectiveness of a school-based cognitive-behavioral anxiety intervention for 8-and 9-year-old children: a controlled trial in Japan. *Mental Health Prevent*, 8, 32–38 doi: 10.1016/j.mhp.2017.10.001

*Kawai, E., Yoshida, T., Miyamoto, H., and Yamanaka, K. (2006). Evaluation of a training program to prevent deterioration of Children's self-esteem. *Jpn. J. Educ. Psychol.*, 54, 112–123 doi: 10.5926/jjep1953.54.1_112

*Kimura, T., and Koizumi, R. (2020). Results of a social and emotional learning program for preventing bullying in junior high School in Relation to students' level of social ability: the Japanese *J. Educ. Psychol.*, 68, 185–201 doi: 10.5926/jjep.68.185

*Kita, T., and Fujiwara, T. (2012). Development of the formation programs of "the basic living customs" for the first graders in an elementary school and the verification of the effects: the practical research at the health observation by a nurse teacher. *J School Educ.*, 24, 31–37. Available at: http://hdl.handle.net/10132/4064

*Kobayashi, T., and Watanabe, Y. (2017). Effects of social skills training on the resilience of Japanese junior high school students. *Jpn. J. Educ. Psychol.*, 65, 295–304 doi: 10.5926/jjep.65.295

Korpershoek, H., Harms, T., de Boer, H., van Kuijk, M., and Doolaard, S. (2016). A Meta-analysis of the effects of classroom management strategies and classroom management programs on students' academic, Behavioral, emotional, and motivational outcomes. *Rev. Educ. Res.* 86, 643–680. doi: 10.3102/0034654315626799

*Koseki, S., Kimura, Y., Yamaguchi, M., Takahashi, F., Shimada, H., Sasaki, K., et al. (2009). Effects of group social skills training on reduction of depression levels: focused on setting up appropriate target skills. *J. Sci. School.*, 10, 39–44. Available at: http://hdl.handle.net/10132/2559

*Koseki, S., Shimada, H., and Sasaki, K. (2007). A cognitive and Behavioral intervention for depression in fifth grade children. *Japan J. Behav. Ther.*, 33, 45–57 doi: 10.14988/pa.2017.0000013576

*Kusaka, N. (2012). The effectiveness of class-wide personal goal pursued program for the improvement of hope in children. *Ann Bullet. Teach*, 1, 44–56. doi: 10.24468/jjbt.37.3_183

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Front. Psychol.* 4, 1–12. doi: 10.3389/fpsyg.2013.00863

Lipsey, M. W., and Wilson, D. B. (2001). *Practical meta-analysis*, Thousand Oaks, CA: Sage Publications

*Masuno, K., and Koizumi, R. (2013). A case study to support a junior high school jouth teacher to implement effectively a psychological educational program. *Bullet Fukuoka Univ Educ*, 3, 41–48. Available at: http://www.sel8group.jp/img/file11.pdf

*Matsubara, K., and Takahashi, F. (2018). 思春期の社交不安に対する学校ベースのacceptance and commitment therapy の有効性[The effectiveness of school-based acceptance and commitment therapy for social anxiety among adolescents]. *Ann. Convent. Japan. Assoc. Cognit. Therapy*, 44, 336–337 doi: 10.24468/jabctc.44.0_336

*Matsumoto, Y., and Shimizu, E. (2016). The FRIENDS cognitive behavioral program in Japanese schools: an examination of the treatment effects. *Sch. Psychol. Int.*, 37, 397–409 doi: 10.1177/0143034316649639

*Matsuo, R., Takeda, S., and Otsuka, M. (2018). 自他尊重の心を育むアサーション・プログラムの開発(2)—中学生への群間比較におけるプログラム効果—[the development of assertion program for nurturing respect to others(2)-the investigation of program effectiveness between junior high school student groups]. *Ann. Convent. Japan. Assoc. Cognit. Therapy*, 44, 236–237 doi: 10.24468/jabctc.44.0_236

McGuinness, L. (2019). Robvis: An R package and web application for visualising risk-of-Bias assessments. Available at: https://github.com/mcguinlu/robvis

MEXT. (2020). *Enhancement of educational counseling system by school counselors and school social workers.* https://www.mext.go.jp/content/20200205-mxt_kyoiku01-000004708_14.pdf

Ministry of Health, Labour and Welfare. (2021). 令和2年度児童生徒の問題行動・不登校等生徒指導上の諸課題に関する調査結果の概要 *[Children's problematic behaviours, results of investigation of school refusal related problems]*. https://www.mext.go.jp/content/20201015-mext_jidou02-100002753_01.pdf

Ministry of Education, Culture, Sports, Science and Technology Japan. (2021). コロナ禍における児童生徒の自殺等に関する現状について[Children's suicide under the COVID-19 pandemic]. Available at: https://www.mext.go.jp/content/20210507-000014796-mxt_jidou02_006.pdf

*Miyata, Y., Ishikawa, S., Sato, H., and Sato, S. (2010). Assessing and enhancing social problem-solving skills in elementary school children (brief notes). *Japan. J. Behav. Therapy*, 36, 1–14 doi: 10.24468/jjbt.36.1_1

Mlinarić, A., Horvat, M., and Šupak Smolčić, V. (2017). Dealing with the positive publication bias: why you should really publish your negative results. *Biochem. Med.* 27:030201. doi: 10.11613/BM.2017.030201

*Mori, K., Abe, M., Kanba, N., Mitami, Y., Nagata, I., Kemuriyama, C., et al. (2009). The effects of "happy class program (social skills training)" on QOL of school children. *Obirin J. Soc. Sci. Human.*, 36, 153–160. Available at: http://id.nii.ac.jp/1598/00001441/

*Morita, N., Nonaka, S., Osao, M., and Shimada, H. (2015). Stress management education based on cognitie behavioral therapy for children and adolescents: recent issues and future prospects. *Waseda J. Clin. Psychol.*, 15, 143–153. Available at: http://hdl.handle.net/2065/47828

*Murakami, Y., and Fukumitsu, T. (2005). Construction of criterion-based problem-aggression scale for children, and intervention with assertiveness training. *Jpn. J. Pers.*, 13, 170–182 doi: 10.2132/personality.13.170

*Nagai, M., and Aoki, K. (2006). A school-based primary prevention program for eating disorders in Japan: the effects of socio-culturally focused intervention in high school girls. Vice President, Executive Director of Ochanomizu University Director of the 21 St Century COE Program" Studies of Human Development from Birth to Death" at Ochanomizu University, 53.

*Nagasaki, A., and Emura, R. (2021). Development and testing of a program to promote prosocial behavior in junior high school students: a focus on empathy and target skill. *Kurume Univ. Psychol. Res.*, 20, 57–66. Available at: http://hdl.handle.net/11316/00001778

*Nakano, Y., Sukigara, M., Shimura, N., Nakagawa, A., and Ono, Y. (2020). Effects of the cognitive Behavioral therapy (CBT) education program for children and adolescents on the adaptation of first-year students to junior high school. *Jpn. J. Educ. Psychol.*, 68, 66–78 doi: 10.5926/jjep.68.66

*Nakayama, K., and Koizumi, R. (2010). Enhancing children's normative consciousness and behavior in a comprehensive learning unit combined with social and emotional learning. *Bullet. Res. Guidance Center Teach. Pract.*, 18, 143–150. Available at: http://www.sel8group.jp/img/file15.pdf

National Center for Child Health and Development. (2021). Reports of national online survey of children's quality of life and health in the COVID-19 pandemic. https://www.ncchd.go.jp/center/activity/covid19_kodomo/report/CxC3_4_eduepo_20210312MH.pdf

NEXT. (2021). *Allocation of consultants and school counsellors.* http://www.mext.go.jp/b_menu/toukei/chousa05/hoken/1268826.htm

*Nishioka, Y., and Sakai, M. (2007). A clinical study of social skills training (SST) in elementary school: examination of SST including self-monitoring phase. Bulletin of Aichi university of education. *Educ. Sci.*, 56, 37–45. Available at: http://hdl.handle.net/10424/179

*Noguchi, D., Yokoshima, T., Kaya, I., and Yamasaki, K. (2021). 「自律的セルフ・エスティーム」を育成する予防教育プログラム(小学校低学年児童版)の開発と教育効果の検証[the development and evaluation of the effectiveness of the preventative educational program for promoting autonomous self-esteem among lower elementary school children]. 63,473. doi: 10.20587/pamjaep.63.0_473

*Oguri, T. (2017). Social skills training for high school students: scale development and efficacy evaluation. *J. Health Psychol. Res.*, 29, 139–149 doi: 10.11560/jhpr.160523040

*Ohira, I., Urao, Y., Sato, Y., Ohtani, T., and Shimizu, E. (2019). A pilot and feasibility study of a cognitive behavioural therapy-based anxiety prevention programme for junior high school students in Japan: a quasi-experimental study. *Child Adolesc. Psychiatry Ment. Health*, 13:40 doi: 10.1186/s13034-019-0300-5

*Okazaki, Y., and Ando, M. (2010). Psychosocial stress in school life and its psychoeducational approach among elementary school students. *Bullet. Res. Develop. Center Educ. Pract.*, 10, 11–20. doi: 10.18926/19998

*Okazaki, Y., and Ando, M. (2011). A mental health education for the prevention of school-life stress in elementary school children: a pilot program involving lectures by a Yogo teacher. *Jpn. J. School Health*, 53, 437–445. doi: 10.20812/jpnjschhealth.53.5_437

*Otani, T., and Kasuya, T. (2014). A group approach program for promoting classroom adaptation of new senior high school students. *Jpn. J Counsel. Sci.*, 47, 96–107 doi: 10.11544/cou.47.2_96

Roy Rosenzweig Center for History and New Media. (2022). Zotero (version 6) [computer software]. Available at: https://www.zotero.org/

*Sakata, A., Kito, H., and Nishioka, N. (2018). Evaluation of a program designed to enhance self-esteem in third-and fourth-grade public elementary school students. *Jpn. J. School Health*, 60, 18–25 doi: 10.20812/jpnjschhealth.60.1_18

Sancassiani, F., Pintus, E., Holte, A., Paulus, P., Moro, M. F., Cossu, G., et al. (2015). Enhancing the emotional and social skills of the youth to promote their wellbeing and positive development: A systematic review of universal school-based randomized controlled trials. Clinical Practice and Epidemiology in Mental. *Health* 11, 21–40. doi: 10.2174/1745017901511010021

*Sato, H., Imajo, T., Togasaki, Y., Ishikawa, S.-I., Sato, Y., and Sato, S. (2009). School-based cognitive behavioral intervention for depressive symptoms in children. *Jpn. J. Educ. Psychol.*, 57, 111–123 doi: 10.5926/jjep.57.111

Sawada, H., and Ishimoto, Y. (2021) Why Japanese teachers not provide psychoeducation that promotes children's mental health? In proceeding of conference presentation. International Cogress of psychology 2021, Prague, Czechoslovakia.

*Shinzato, K., Kakazu, T., Uezu, T., Shimabukuro, Y., Uema, S., Kase, M., et al. (2004). 学級経営に生かす社会的スキルの研究 1: 学級担任とスクールカウンセラーによるTT授業を通して [research of social skills training for classroom management 1: TT teaching by homeroom teacher and school counsellor]. *Bullet Okinawa Prefectural Univ. Arts*, 12, 65–89. Available at: https://ci.nii.ac.jp/naid/40007285778

*Shiomi, K., and Akutagawa, J. (2002). The effect of the mental concentration method (cotention method by Dr.Burrow) for decreasing of stressful feeling of elementary school children. *Hyogo Univ. Teach. Educ. J.*, 22, 23–35. Available at: https://iss.ndl.go.jp/books/R000000004-I6689647-00

Sklad, M., Diekstra, R., Ritter, M. D., Ben, J., and Gravesteijn, C. (2012). Effectiveness of school-based universal social, emotional, and behavioral programs: Do they enhance students' development in the area of skill, behavior, and adjustment? *Psychology in the Schools* 49, 892–909. doi: 10.1002/pits.21641

Sterne, J. A., Hernán, M. A., Reeves, B. C., Savović, J., Berkman, N. D., Viswanathan, M., et al. (2016). ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ* 355, 1–7. doi: 10.1136/bmj.i4919

*Suzuki, M., and Kawase, M. (2013). Practice of psycho-education for junior high school students to enhance their self-esteem: through coordination with school psychologist and teachers. *J. Child Health*, 72, 699–705. Available at: https://www.jschild.med-all.net/Contents/private/cx3child/2013/007205/016/0699-0705.pdf

*Tagaya, T., and Sasaki, K. (2008). Incidental social skills training for pupils in a fourth grade classroom. *Jpn. J. Educ. Psychol.* 56, 426–439. doi: 10.5926/jjep1953.56.3_426

*Takahashi, F., and Koseki, S. (2011). Effects of class-wide social skills training for children adolescents in Japan: a Meta-analytic review (review). *Jpn J. Behav. Therapy*, 37, 183–194 doi: 10.24468/jjbt.37.3_183

*Takahashi, T., Dodo, N., Osawa, K., Kanai, Y., and Sakano, Y. (2006). The effect of stress management program using the relaxation for children. *Stress Manage. Res.*, 3, 35–40. Available at: https://plaza.umin.ac.jp/jssm-since2002/smr/SMR3-1.pdf

Takahashi, F., and Koseki, S. (2011). Effects of class-wide social skills training for children adolescents in Japan: A meta-analytic review. *Japanese Journal of Behavior Therapy* 37, 183–194. doi: 10.24468/jjbt.37.3_183

*Takahashi, T., and Sakano, Y. (2010). The effect of stress management program focused on the variety of coping for children. *Stress Manage. Res.*, 7, 25–31. Available at: https://ci.nii.ac.jp/naid/40017386724/

*Takao, H. (2004). The study of clinical psychology on audio-visual effect of experience overcoming bully of others-application to junior high school students. *Bullet. School Psychol. Counsel.*, 8, 51–60.

*Tanaka, N., Koizumi, R., Yamada, Y., Hakoda, Y., and Komatsu, S. (2009). 小学生を対象にした子どもの安全を守る(暴力防止)プログラムの試行[a trial of violence prevention program targetted at primary school children]. *Ann. Convent. Jpn. Assoc. Educ. Psychol.*, 51:254. doi: 10.20587/pamjaep.51.0_254

*Tanaka, O., Koshikawa, F., and Matsuura, M. (2014). Stress management program with self-instructional training: effectiveness of the program and evaluation from the students. *Stress Sci Res*, 29, 68–76 doi: 10.5058/stresskagakukenkyu.29.68

*Tanaka, R., Takahashi, T., and Sato, S. (2016). Effects of social problem-solving training on elementary school Children's stress responses: a long-term follow-up. *Jpn. J. Behav. Therapy*, 42, 85–97 doi: 10.24468/jjbt.42.1_85

*Taniguchi, H. (2013). A practical intervention to promote primary school students' interpersonal stress coping (postponed-solution coping) in order to reduce their stress responses. *J. Educ. Res.*, 12, 87–96. Available at: http://hdl.handle.net/10069/31373

Taylor, R. D., Oberle, E., Durlak, J. A., and Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a Meta-analysis of follow-up effects. *Child Dev.* 88, 1156–1171. doi: 10.1111/cdev.12864

The Ministry of Education, Culture, Sports, Science and Technology. (2020). Enhancement of educational counseling system by school counselors and school social workers. Available at: https://www.mext.go.jp/content/20200205-mxt_kyoiku01-000004708_14.pdf

*Togo, E. (2007). The effect of a developmental education program to enhance nurturance (Yougosei) for children: junior high school students' school life and community relations. *Res. Early Childhood Care Educ. Japan*, 45, 210–220 doi: 10.20617/reccej.45.2_210

*Togo, E. (2010). Conducting and evaluating a developmental educational program to enhance the nurturance of junior high school. *Jpn. J. Commu. Psychol.*, 14, 68–86 doi: 10.32236/jscpjournal.14.1_68

*Uechi, A., Kakazu, T., Shinzato, K., Uema, S., Mitsuru, K., Kase, M., et al. (2007). The study of class-wide social skills training for junior high school students. *Bullet. Faculty Educ.*, 14, 235–247. Available at: https://cir.nii.ac.jp/crid/1520290883289713664

*Ueno, J., Akazawa, J., Matsunami, T., Inosaki, A., Shimomura, J., Kitayma, Y., et al. (2019). Effect of violence prevention program using active learning-for high school students. *Annual convention of the Japanese Association of Educational Psychology*. 61, 202. doi: 10.20587/pamjaep.61.0_202

*Urao, Y., Ohira, I., Koshiba, T., Ishikawa, S., Sato, Y., and Shimizu, E. (2021). Classroom-based cognitive behavioural therapy: a large-scale non-randomised controlled trial of the 'journey of the brave.' *Child Adolesc. Psychiatry Ment. Health*, 15, 1–10 doi: 10.1186/s13034-021-00374-6

*Urao, Y., Yoshida, M., Koshiba, T., Sato, Y., Ishikawa, S., and Shimizu, E. (2018). Effectiveness of a cognitive behavioural therapy-based anxiety prevention programme at an elementary school in Japan: a quasi-experimental study. *Child Adolesc. Psychiatry Ment. Health*, 12:33 doi: 10.1186/s13034-018-0240-5

*Urao, Y., Yoshida, M., Sato, Y., and Shimizu, E. (2022). School-based cognitive Behavioral intervention program for addressing anxiety in 10- to 11-year-olds using short classroom activities: a quasi-experimental study. *BMC Psychiatry* 22, 1–12. doi: 10.21203/rs.3.rs-49225/v

Wang, K., Varma, D. S., and Prosperi, M. (2018). A systematic review of the effectiveness of mobile apps for monitoring and management of mental health symptoms or disorders. *Journal of Psychiatric Research* 107, 73–78. doi: 10.1016/j.jpsychires.2018.10.006

*Watanabe, M. (2013). 高校生への認知再構成法による心理教育プログラムの効果 [effect of psychoeducation program on cognitive reconstruction method for high school students]. Master thesis, Hyogo University of Teacher Education. Available at: http://repository.hyogo-u.ac.jp/dspace/bitstream/10132/6718/1/YU12602028.pdf

Wigelsworth, M., Lendrum, A., Oldfield, J., Scott, A., ten Bokkel, I., Tate, K., et al. (2016). The impact of trial stage, developer involvement and international transferability on universal social and emotional learning programme outcomes: A meta-analysis. *Cambridge Journal of Education* 46, 347–376. doi: 10.1080/0305764X.2016.1195791

Wilson, S. J., and Lipsey, M. W. (2007). School-based interventions for aggressive and disruptive behavior: update of a meta-analysis. *Am. J. Prev. Med.* 33, S130–S143. doi: 10.1016/j.amepre.2007.04.011

van de Sande, M. C. E., Fekkes, M., Kocken, P. L., Diekstra, R. F. W., Reis, R., and Gravesteijn, C. (2019). Do universal social and emotional learning programs for secondary school students enhance the competencies they address? A systematic review. *Psychology in the Schools* 56, 1545–1567. doi: 10.1002/pits.22307

*Yamada, Y., and Koizumi, R. (2017). 幼児対象の社会性と情動の学習 (SEL-8N) プログラムの実践効果—保護者評定を含めた検討—[practical effects of social and emotional learning (SEL-8N) programs for young children-examination including parental evaluation-]. *Ann. Convent. the Jpn. Assoc. Educ. Psychol.*, 59:171 doi: 10.20587/pamjaep.59.0_171

*Yamada, Y., and Koizumi, R. (2020). Effects of the "social and emotional learning of 8 abilities at the nursery school" (SEL-8N) program on preschool children's social behavior. *Jpn. J. Educ. Psychol.*, 68, 216–229 doi: 10.5926/jjep.68.216

*Yamada, Y., and Kurihara, S. (2010). 小中連携による社会性と情動の学習プログラムの効果 [effects of social and emotional learning programs through collaboration between elementary and junior high schools]. *Ann. Convent. Jpn. Assoc. Educ. Psychol.*, 52:303 doi: 10.20587/pamjaep.52.0_303

*Yamaguchi, S., Foo, J. C., Kitagawa, Y., Togo, F., and Sasaki, T. (2021). A survey of mental health literacy in Japanese high school teachers. *BMC Psychiatry*, 21:478 doi: 10.1186/s12888-021-03481-y

*Yamaguchi, T., and Arashima, C. (2018). Practical study on social skills training for junior high school students. *J. Stud. Educ. Pract.*, 21, 89–107 doi: 10.50841/kyoikujissen.21.0_89

*Yamamoto, T., Matsumoto, Y., and Bernard, M. E. (2017). Effects of the cognitive-behavioral you can do it! Education program on the resilience of Japanese elementary school students: a preliminary investigation. *Int. J. Educ. Res.*, 86, 50–58 doi: 10.1016/j.ijer.2017.08.006

*Yamasaki, K., Murakami, Y., Yokoshima, T., and Uchida, K. (2015). Effectiveness of a school-based universal prevention program for enhancing self-confidence: considering the extended effects associated with achievement of the direct purposes of the program. *Int. J. Appl. Psychol.*, 5, 152–159. doi: 10.5923/j.ijap.20150506.02

*Yamasaki, K., Umakoshi, A., and Uchida, K. (2017). Efficacy of a school-based universal program for bullying prevention: considering the extended effects associated with the achievement of the direct purposes of the program. *Int'l J. Soc. Sci. Stud.*, 5:1. doi: 10.11114/ijsss.v5i8.2534

*Yamashita, Y., and Kubota, Y. (2017). Effectiveness of social interactive games among third graders: social anxiousness, social skills, and group cohesiveness in the classroom *Jpn. J. Counsel. Sci.*, 50, 121–132. doi: 10.11544/cou.50.3.4_121

*Yamato, K., and Koizumi, R. (2015). Research on children s adaptation to school in partnership with parents: a trial of Tomoiku project based on SEL-8S program implementation. *Bullet. Fukuoka Univ. Educ*, 5, 47–54.

Yamaguchi, S., Ojio, Y., Foo, J. C., Michigami, E., Usami, S., Fuyama, T., et al. (2020). A quasi-cluster randomized controlled trial of a classroom-based mental health literacy educational intervention to promote knowledge and help-seeking/helping behavior in adolescents. *Journal of Adolescence* 82, 58–66. doi: 10.1016/j.adolescence.2020.05.002

*Yokoshima, T., Kageyama, A., Kaya, I., Uchida, K., and Yamasaki, K. (2020). Effectiveness of a school-based universal prevention program: "development of autonomous self-esteem" in 5th-grade children. *Bullet. Center Collab. Commun. Naruto Univ. Educ.*, 34, 77–84. doi: 10.24727/00028520

*Yoshida, K., Otani, T., and Furutani, K. (2012). Effects of social skills training in the classroom on children's social skills. *Jpn. J. Clin. Educ. Psychol.*, 28, 31–39. Available at: https://cir.nii.ac.jp/crid/1520572357250417152

Zhan, L., Guo, D., Chen, G., and Yang, J. (2018). Effects of repetition learning on associative recognition over time: role of the Hippocampus and prefrontal cortex. *Front. Hum. Neurosci.* 12:277. doi: 10.3389/fnhum.2018.00277

*Zhuang, Y., Koizumi, R., Otsubo, Y., Egashira, M., Tanaka, A., and Ihara, A. (2008). Effects of social and emotional learning with self-study material and behavioral rehearsal on Japanese high school students in the correspondence course. *Bullet. Res. Guidance Center Teach. Pract.*, 16, 131–136. Available at: https://cir.nii.ac.jp/crid/1520572359032037888