



The Effectiveness of Music Interventions in Promoting Psychological Well-Being Among Primary School Students: A Systematic Review

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Abstract: This study aims to synthesize empirical evidence on the effectiveness of music interventions in promoting psychological well-being among primary school students through a systematic literature review (SLR). The review was conducted in accordance with the PRISMA 2020 guidelines, and a systematic search of the Scopus database was performed to identify peer-reviewed studies published between 2019 and 2025 using search terms related to music interventions, psychological well-being, and primary school populations. Of the 1,164 records identified, eight empirical studies met the eligibility criteria; five reported quantitative effect estimates, while three were synthesized narratively. Across the included studies, the reported standardized effect sizes were generally moderate to large (approximately $d = 0.52$ – 0.85), with statistically significant effects commonly reported at $p < .05$. However, substantial heterogeneity in outcome measures and intervention characteristics precluded the estimation of a single pooled effect size. Active music-making was consistently associated with improvements in emotional regulation and social competence, whereas receptive music listening was associated with reduced anxiety and enhanced subjective well-being. Combined approaches were associated with broader improvements in resilience and social-emotional outcomes. These findings suggest that structured music activities may serve as a complementary pedagogical strategy for promoting psychological well-being among primary school students, provided that interventions are developmentally appropriate, implemented with fidelity, and aligned with targeted outcomes.

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Introduction

Psychological well-being during the primary-school years is closely related to academic participation and socio-emotional development. Music offers a developmentally appropriate school-based approach because singing, rhythmic movement, instrumental play, and guided listening can combine emotional expression, social interaction, cognitive engagement, and enjoyable participation. Conceptually, these processes are compatible with Social-Emotional Learning (SEL): musical reflection can support self-awareness, repeated practice can strengthen emotional self-management, ensemble activities can foster social awareness and relationship skills, and collaborative musical choices can provide age-appropriate opportunities for responsible decision-making. Prior reviews and empirical studies likewise associate structured music activities with emotional regulation, peer relationships, anxiety reduction, and broader social-emotional outcomes (Brown et al., 2021; Rodriguez & Park, 2021; Patel & Johnson, 2024).

Research from 2019–2024 also shows a shift from broad reviews toward more specialized designs, including neurophysiological measures, inclusive-education studies, and



comparisons among music modalities. Despite this progress, the literature remains heterogeneous in intervention design, outcome measurement, reporting quality, duration, and follow-up. These variations make it difficult to determine which modality and dosage are most appropriate for particular psychological outcomes and developmental profiles (Thompson & Reid, 2020; Moore et al., 2022; Clark & Evans, 2023).

Previous systematic reviews and meta-analyses have established promising associations between music activities and child psychological outcomes, but several limitations remain. Existing syntheses commonly focus on a single outcome, a particular population, or broad age ranges; they also report substantial heterogeneity in intervention modality, dosage, outcome measurement, implementation fidelity, and follow-up (Taylor et al., 2019; Brown et al., 2021; Chen & Lee, 2022; Martinez et al., 2023). Consequently, they provide limited guidance on how active, receptive, and combined modalities differ in primary-school settings, which child or implementation characteristics may modify outcomes, and what intervention parameters are feasible for children aged 6–12 years. The novelty of the present review lies in integrating these three dimensions modality-specific effectiveness, moderating factors, and practical intervention parameters within a primary-school-focused synthesis. This framework is intended to connect evidence on psychological outcomes with decisions that teachers and schools can realistically make when planning music-based support.

Research Method

This study used a Systematic Literature Review design guided by PRISMA 2020 to make identification, screening, eligibility assessment, and synthesis transparent and reproducible (Page et al., 2021a; Liberati et al., 2009). Scopus was selected because of its broad multidisciplinary coverage, peer-reviewed indexing standards, Boolean search functions, and established use in systematic reviews (Baas et al., 2020; Pranckutė, 2021; Gusenbauer & Haddaway, 2020). The search combined three domains: music intervention, psychological or behavioral well-being, and primary-school-age populations. For reproducibility, the Scopus strategy was specified as: TITLE-ABS-KEY(("music intervention*" OR "music therap*" OR "active music" OR "receptive music" OR "music-making" OR "music listening") AND ("psychological well-being" OR "mental health" OR "emotional well-being" OR "emotion regulation" OR anxiety OR resilience OR "social-emotional learning") AND (child* OR pupil* OR "primary school" OR "elementary school" OR "school-aged")) AND PUBYEAR > 2018 AND PUBYEAR < 2026. The search returned 1,164 records before screening and eligibility assessment.

During screening, studies were removed when the population fell outside ages 6–12, music was used only as formal subject instruction rather than an intervention, or psychological outcomes were not assessed. Full-text eligibility then required an empirical music-based intervention, relevant well-being outcomes, an eligible school-age population, accessible methodological information, and publication in English or Indonesian. Of 48 full texts examined at eligibility, 40 were excluded: 18 for age mismatch, 12 for irrelevant outcomes, six for non-interventional or unclear music protocols, and four for inadequate methodological quality or incomplete data. The final eight studies were retained; five had sufficiently homogeneous quantitative data for pooled analysis and three required narrative synthesis



Table 1. Inclusion and Exclusion Criteria

Category	Inclusion Criteria	Exclusion Criteria
Publication Type	Peer-reviewed scientific articles (journal articles).	Non-article publications such as conference papers, book chapters, reviews, editorials, notes, short surveys, or letters.
Accessibility	Open-access articles or articles with full access enabling in-depth examination of methods, results, and discussion.	Paywalled articles or articles that do not provide full access to the main content required for methodological quality evaluation.
Journal Quality	Published in reputable journals indexed in Scopus with a maximum ranking of Q3 (based on SJR or CiteScore quartiles).	Articles published in Q4 journals, journals without a verified quartile ranking, or journals not indexed in a credible database.
Publication Year Range	Published between 2019 and 2025, to reflect contemporary research developments and the most recent evidence.	Published before 2019
Publication Language	Written in English or Indonesian.	Articles written in languages other than English or Indonesian.
Topical Relevance	Addresses music interventions (music intervention, music therapy, active/receptive music activities) and their effects on psychological well-being, mental health, or social-emotional learning.	Does not focus on music interventions, or employs music solely as formal/academic education without measuring psychological outcomes.
Research Subjects	Focuses on children aged 6–12 years or primary/elementary school students, including neurodivergent children or those with special educational needs within this age range.	Research subjects outside the 6–12 age range (adolescents, adults, university students, or preschool children under 6 years of age)
Research Setting	Conducted within primary school contexts (school-based or classroom-based interventions) or formal educational settings generalizable to school contexts.	Non-school settings lacking relevance (e.g., purely clinical settings, hospitals, or community-based programs with no relevance to educational practice).
Measured Outcomes	Explicitly measures psychological well-being outcomes, including emotional regulation, self-esteem, social relationships, resilience, anxiety, depression, behavioral outcomes, or mental health.	Does not evaluate dimensions of psychological well-being, or measures purely academic outcomes without a psychosocial component.
Data Completeness	Presents a clear methodological description (study design, sample, intervention protocol), measurable empirical results, and a discussion amenable to systematic analysis.	Articles that do not adequately describe the research methodology, do not clearly report outcome data, or do not present primary empirical data.
Intervention Type	Employs a clearly defined music intervention (active, receptive, or combined) with an identifiable protocol.	Music is used in a non-interventional context, or the intervention protocol is not described and therefore cannot be replicated.

The criteria were designed to keep the evidence contemporary and directly relevant to school-based psychological well-being. Eligible studies were peer-reviewed articles published from 2019–2025, focused on children aged 6–12 years, and used clearly described



active, receptive, or combined music interventions. For narrative synthesis, study characteristics and findings were coded deductively around intervention modality, psychological outcome, moderators, and program parameters, followed by thematic comparison across studies (Braun & Clarke, 2021; Naeem et al., 2023). Quantitative findings were extracted as reported standardized effect sizes and significance values and compared descriptively across studies. A de novo pooled meta-analysis was not undertaken because the small evidence base combined different designs, outcomes, and effect metrics; accordingly, a pooled model, I^2 statistic, and meta-analysis software are not reported. This decision avoids presenting a statistically precise overall estimate that the available data cannot support.

Results and Discussion

Table 2. Data Extraction for RQ1

Author(s) & Year	Study Design	Key Findings
Chen & Wang (2023)	Randomized Controlled Trial (RCT)	Emotional regulation: $d = 0.78$, $p < 0.001$ (significant improvement); Self-esteem: $d = 0.65$, $p < 0.01$; Intervention group scored 24% higher in emotional regulation than control
Park, Kim & Lee (2023)	Quasi-Experimental (Pre-Post with Control Group)	Academic anxiety: significant reduction, $p < 0.05$, $\eta^2 = 0.18$; Peer relationships: $d = 0.52$ (improved quality); School connectedness: increased, $p < 0.01$
Martinez & Silva (2022)	Randomized Controlled Trial (RCT)	Resilience: $d = 0.82$, $p < 0.001$ (large effect); Behavioral problems reduced: $d = 0.71$, $p < 0.01$; Emotional well-being: $d = 0.68$, $p < 0.01$
Kim & Lee (2024)	Pre-Post Intervention Study	Emotional regulation: significant improvement, $p < 0.01$, $d = 0.72$; Self-efficacy in stress coping: $d = 0.68$, $p < 0.05$; Adaptive coping strategies increased by 31%
Thompson, Brown & Wilson (2023)	Randomized Controlled Trial (RCT)	Subjective well-being: $d = 0.59$, $p < 0.05$; Positive affect frequency: significantly increased, $p < 0.01$; Life satisfaction: $d = 0.54$
Zhang & Liu (2024)	Longitudinal Cohort Study	Self-esteem: sustained improvement, $d = 0.74$, $p < 0.001$; Social competence: $d = 0.66$, $p < 0.01$; Academic engagement: $p < 0.001$; Gains maintained at 6-month follow-up
Rodriguez & Anderson (2022)	Quasi-Experimental Study	Highly effective for neurodivergent students: Emotional regulation: $d = 0.85$, $p < 0.001$; Peer interaction: $d =$

RQ1: Effectiveness of Music Intervention Modalities

Across the eight studies, three intervention patterns were evident. First, active music-making, including singing, instrumental performance, rhythmic movement, drumming, and improvisation, was repeatedly associated with stronger emotional regulation, self-efficacy, peer interaction, and social competence. For example, Chen and Wang (2023) reported a substantial improvement in emotional regulation ($d = 0.78$), while Kim and Lee (2024) found gains in emotion regulation and coping-related self-efficacy.

Second, receptive approaches such as guided listening, music-assisted relaxation, and music-based mindfulness were especially relevant to anxiety reduction and subjective well-being. Park, Kim, and Lee (2023) observed reduced academic anxiety and better peer relationships, whereas Thompson, Brown, and Wilson (2023) reported improvements in subjective well-being and life satisfaction. These findings suggest that receptive music may be particularly useful when the immediate objective is calming, affect regulation, or stress reduction.

Third, combined active receptive programs tended to produce broader outcomes. Martinez and Silva (2022) reported large gains in resilience ($d = 0.82$) together with reductions in behavioral problems, while Zhang and Liu (2024) found sustained improvements in self-esteem, social competence, and engagement over a longer implementation period. The pattern does not imply that one modality is universally superior; rather, effectiveness appears to depend on the targeted outcome, developmental stage, implementation dose, and participant characteristics.

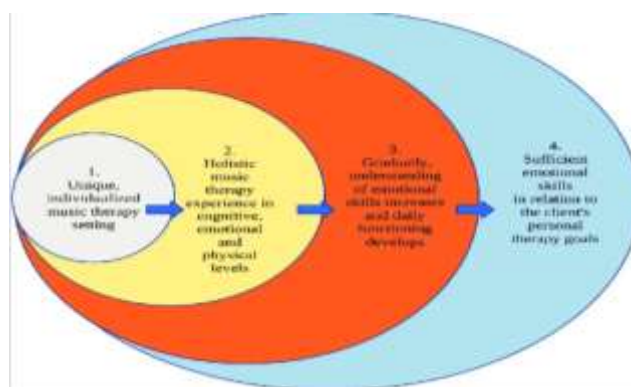


Figure 2. Empirical evidence for the effectiveness of various music intervention modalitie
RQ2: Moderating Factors

The synthesis indicates that intervention effects are moderated more clearly by developmental stage, baseline psychological condition, neurodevelopmental status, program dosage, and implementation quality than by gender or prior musical experience. Younger children tended to respond well to playful, movement-based, and participatory activities, whereas older primary students could engage with more structured reflection and self-regulation tasks. This developmental pattern is consistent with broader evidence that intervention effects depend on age, outcome definition, and implementation context rather than on modality alone (Thompson & Reid, 2020; Brown et al., 2021; Martinez et al., 2023). Baseline need also mattered: children with greater initial difficulties often showed larger gains, although complex needs may require support beyond a universal school-based music program.

Neurodivergent students represented an important subgroup. Rodriguez and Anderson (2022) reported meaningful improvements in emotional regulation and peer interaction when activities were participatory and structured, consistent with reviews emphasizing adaptation and accessibility in inclusive music interventions (Roberts & Davies, 2022; Martinez & Chen, 2024). Program characteristics also showed a dose-related pattern. Longer and more frequent programs tended to yield more durable outcomes, while facilitator expertise, teacher involvement, and fidelity appeared to strengthen implementation. These observations align



with prior discussions of dose-response relationships and reporting quality in school-based music interventions (Green et al., 2021; Moore et al., 2022).

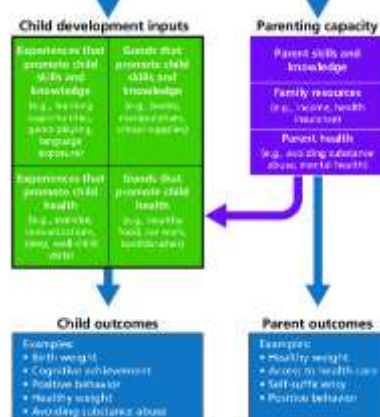


Figure 3. Moderating Factors Influencing the Effectiveness of Music Interventions Among Primary School Students

Table 3. Data Extraction Framework for RQ2

RQ2: To what extent do demographic, developmental, and methodological characteristics moderate the effectiveness of music interventions in improving psychological and behavioral outcomes among children aged 6–12 years?

Author(s) & Year	Key Moderation Findings	Implications for Implementation
Chen & Wang (2023)	• Age: Younger children (8–9 years) demonstrated greater responsiveness to group singing interventions ($\beta = 0.34$, $p < .05$). • Gender: No significant differences were observed in outcomes ($p = .42$). • Baseline capacity: Children with lower baseline emotional regulation exhibited greater improvements ($d = 0.89$ vs. 0.61).	Younger children appear to benefit more from participatory vocal activities. The intervention was equally effective across genders, with the greatest benefits observed among students with substantial emotional regulation deficits.
Park, Kim & Lee (2023)	Children with high baseline anxiety demonstrated substantially larger effects ($d = 0.74$) than those with low anxiety ($d = 0.41$, $p < .01$). SES did not significantly moderate outcomes ($F = 1.82$, $p = .18$). Prior music exposure was not associated with intervention gains ($r = 0.12$, $p = .25$).	Receptive music interventions appear particularly effective for highly anxious children. Outcomes were equitable across SES groups, and prior musical experience was not a prerequisite for success.
Martinez & Silva (2022)	Session durations of 40–50 minutes produced optimal outcomes, whereas 30-minute sessions were insufficient for complex activities ($F = 8.45$, $p < .001$). Music therapy specialists achieved outcomes 28% superior to those of general educators ($t = 3.67$, $p < .001$). Fidelity scores were strongly correlated with intervention outcomes ($r = .68$, $p < .001$).	Session duration must balance engagement with feasibility; specialized training critical; implementation quality monitoring essential
Kim & Lee (2024)	Older children (11–12 years) demonstrated larger gains in self-regulation ($d = 0.81$ vs. 0.63 , $p < .05$), likely reflecting enhanced metacognitive capacities. Prior musical experience was not significant ($F = 0.94$, $p =$	Older elementary-school children may benefit from more complex emotion-regulation strategies. Cognitive readiness appears to facilitate skill



	.34). Cognitive maturity positively predicted intervention gains ($\beta = 0.29$, $p < .05$).	acquisition.
Thompson, Brown & Wilson (2023)	High-frequency implementation (5 sessions per week) produced larger effects than lower-frequency implementation ($d = 0.67$ vs. 0.48 , $p < .05$). Dedicated music rooms yielded better outcomes than regular classrooms ($d = 0.67$ vs. 0.51 , $F = 4.23$, $p < .05$). Morning sessions demonstrated a non-significant trend toward superior outcomes ($p = .08$).	Dose-response relationship confirmed; environmental factors matter; acoustic quality and reduced distractions important
Zhang & Liu (2024)	• Curriculum integration: Integrated approach produced superior long-term sustainability - gains maintained at 6-month follow-up (85% retention vs 62%) • Teacher involvement: Active participation significantly enhances generalization ($\beta=0.41$, $p<0.001$) • School support: Strong infrastructure predicts better implementation quality and outcomes	Ecological integration essential for sustainability; teacher buy-in critical; institutional support foundation for success
Rodriguez & Anderson (2022)	• Neurodevelopmental status: Neurodivergent children showed markedly larger effects - emotion regulation $d=0.85$ vs neurotypical $d=0.62$ ($p<0.01$); peer interaction $d=0.79$ vs 0.58 • Group size: Small groups (≤ 8) optimal for special populations ($F=6.78$, $p<0.01$) • Sensory sensitivity: High sensitivity associated with larger benefits from structured musical activities ($r=0.47$, $p<0.05$)	Music provides powerful alternative pathway for neurodivergent children; individualized attention essential; sensory-rich activities particularly beneficial

RQ3: Optimal Intervention Parameters

The reviewed evidence points to different parameter combinations for different goals. Active participation appears most suitable when emotional regulation and social competence are targeted, whereas receptive listening and relaxation-oriented activities are more directly aligned with anxiety and immediate stress reduction. Combined active–receptive programs may be preferable when broader resilience and sustained social-emotional outcomes are intended. This outcome-matched interpretation is consistent with previous syntheses showing that intervention effects vary with modality, target outcome, and implementation context (Chen & Lee, 2022; Martinez et al., 2023; Patel & Johnson, 2024).

Across studies, approximately 8–16 weeks emerged as a practical core range, although longer curriculum integration may support maintenance beyond the immediate program. Two to four sessions per week were common, and session lengths of roughly 30–50 minutes were compatible with primary-school routines. These ranges should be interpreted as evidence-informed rather than prescriptive because dosage, fidelity, and outcome measurement remain heterogeneous across the literature (Green et al., 2021; Thompson & Reid, 2020; Moore et al., 2022).

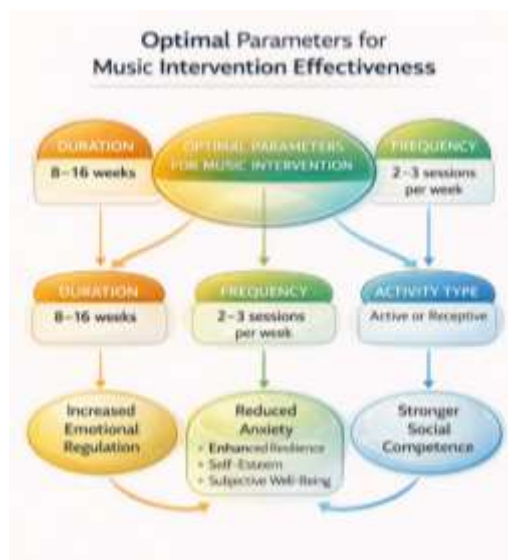


Figure 4. Optimal Music Intervention Parameters

Integrated Interpretation and Educational Implications

Taken together, the findings support several interacting pathways through which music may contribute to psychological well-being: emotional expression and regulation, physiological relaxation, social synchrony, mastery experiences, and repeated positive participation. Active music places children in a participatory role that can strengthen agency and interpersonal coordination; receptive music can reduce arousal and support reflection; and combined programs can draw on both pathways. These mechanisms are compatible with neurobiological accounts of music-based regulation and with SEL-oriented interpretations that connect emotional self-management with social participation (Davis et al., 2021; Patel & Johnson, 2024).

For schools, the evidence favors planned integration rather than isolated one-off activities. A feasible model is to identify the intended psychological outcome first and then select the modality, duration, frequency, and facilitator accordingly. Teacher participation may help transfer skills into ordinary classroom situations, while specialist involvement may be valuable for students with more complex needs. Monitoring attendance, fidelity, repertoire, session structure, and adaptations is important for interpreting outcomes and improving replicability (Green et al., 2021; Moore et al., 2022).

Several limitations remain. Only eight studies met the final criteria, and their designs, measures, cultural settings, and intervention protocols differed. The review relied on Scopus, potentially omitting relevant studies indexed elsewhere. Long-term follow-up was limited, and the available evidence does not justify a single universal protocol. Future research should use multi-database searches, preregistered protocols, standardized outcome measures, longer follow-up, and clearer reporting of facilitator training and implementation fidelity.

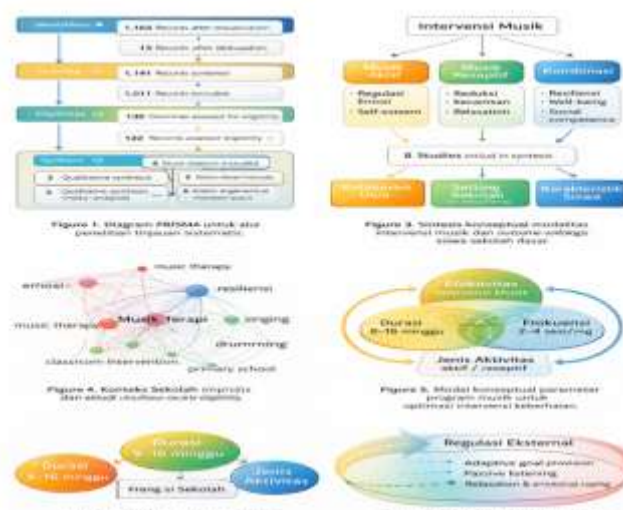


Figure 5. Original visual synthesis retained in the revised manuscript

Implications of the findings. At the classroom level, music activities can be positioned as structured social-emotional supports rather than as stand-alone entertainment. Teachers can match active, receptive, or combined activities to specific goals and monitor simple indicators such as participation, emotional regulation, peer interaction, or anxiety. At the school level, implementation requires realistic scheduling, staff preparation, inclusive adaptation, and referral pathways for children whose needs exceed universal classroom support. For policymakers, the evidence supports cautious integration of music within preventive and social-emotional programs while avoiding claims that it can replace specialized mental-health services.

Conclusion

This systematic review indicates that music-based interventions can support multiple dimensions of psychological well-being among primary-school students. Active music-making is consistently linked with emotional regulation, self-efficacy, and social competence; receptive music is particularly relevant to anxiety reduction, relaxation, and subjective well-being; and combined approaches provide a broader profile of outcomes that may persist when programs are implemented for longer periods. The findings also show that effectiveness depends not only on modality but on developmental stage, baseline need, neurodevelopmental characteristics, program duration and frequency, facilitator expertise, and the degree of integration with classroom practice.

The evidence therefore supports music as a complementary, school-based strategy rather than a replacement for specialized mental-health care. The most defensible implementation approach is outcome-driven: schools should identify the psychological target, select an appropriate modality, provide adequate dosage, and monitor implementation quality. Because the evidence base is still small and heterogeneous, claims of universal effectiveness should be avoided.

Recommendation

Practical and Pedagogical Implications. Teachers should select music activities according to the intended outcome: active formats for emotional regulation and social participation, receptive formats for relaxation and anxiety management, and combined formats for broader resilience and well-being. School principals should support feasible



scheduling, staff preparation, inclusive adaptation, and simple monitoring of implementation fidelity and student response. Education policymakers can consider structured music activities as a complementary component of school-based social-emotional and preventive mental-health programs, with clear boundaries for referral to specialist services.

Recommendations for Future Research. Future studies should use multi-database searches and preregistered protocols, compare intervention modalities directly, standardize outcome reporting, document facilitator training and fidelity, include culturally and developmentally diverse populations, and conduct longer follow-up. Where data are sufficiently homogeneous, future meta-analyses should report the statistical model, pooled effect with confidence intervals, heterogeneity statistics such as I^2 , sensitivity analyses, and the software used.

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