

A Systematic Review of Research on the Efficacy of Musical Therapy for the Treatment of Psychopathology in Children and Adolescents

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Abstract

The goals of this review were to (1) determine whether music therapy is effective for kids and teens with psychopathology and (2) determine whether and how factors such as pathology type, client age, music therapy approach, and outcome type affect the magnitude of the effect of music therapy. The methodology for the meta-analysis includes eleven studies with a total of one hundred eighty-eight participants. After combining the effect sizes and taking the sample size into account, the distribution of these effects was analysed. Findings: Music therapy had a statistically significant and homogenous medium to large positive effect ($ES \ 1.61$) on clinically relevant outcomes after one outlying extremely positive value was excluded from the study. There was no indication of any bias in the publishing. The effects were more pronounced for emotional illnesses than behavioural and developmental disorders; for humanistic, eclectic, and psychodynamic methods, the effects were more pronounced than for behavioural models; and for social skills and self-concept, the effects were less pronounced than for behavioural and developmental outcomes. We conclude by talking about the implications for future studies and clinical practice. Music, psychotherapy, music therapy, developmental delay, behavioural issues, and meta-analysis.

Keywords: *Behaviour problems, developmental delay, meta-analysis, music*

1. Introduction

Various mental diseases affect children and adolescents, affecting their emotions, cognition, and conduct. The overall prevalence of these disorders ranges from 8% to 26%, as reported by Remschmidt & Schmidt (1994) and Verhulst & Koot (1992) and Weisz & Weiss (1993). Although there are a variety of psychotherapeutic approaches to these issues, empirical testing has only been conducted on a small subset of these methods (Bergin & Garfield, 1994; Weisz & Weiss, 1993). For individuals who have difficulty communicating verbally, music therapy offers hope as it employs musical interaction as a form of nonverbal communication. Patients who have trouble expressing themselves verbally or who, on the other hand, justify their emotional issues through words may benefit greatly from this method. The range of mental problems that can benefit from music therapy, nevertheless, is far wider.

Music therapy models draw on a wide range of theoretical traditions, including humanistic, behavioural, and psychodynamic theories. According to Bissegger et al. (1998), Bruscia (1998), Drieschner and Pioch (2001), and Fitzthum, Oberegelsbacher, and Storz (1997), music therapy techniques can be categorised as either active or receptive, and as improvised or structured. Two of the most well-known psychodynamic approaches of music therapy are Analytical Music Therapy (AMT; Priestley, 1975, 1994) and Guided Imagery and Music (GIM; Bonny, 1975; Bonny & Savary, 1973). Symbolically expressing inner feelings and associations through free

improvisation is central to AMT, while listening to recorded music might evoke reflective pictures in GIM. Both models highlight the significance of the lyrics conveying the inner thoughts and feelings conveyed by the music.

Humanistic approaches to music therapy draw from the work of both Perls and Rogers in their use of musical improvisation to bring attention to experiences in the present moment and to facilitate emotional awareness (Frohne-Hagemann, 1990; Hege, 1988). Additionally, there are humanistic theory-based methods of music therapy such as Orff Music Therapy (Orff, 1974, 1989) and Creative Music Therapy (Nordoff & Robbins, 1977) that employ improvisation in a more organised manner than the types previously stated. Based on Skinner's behaviourist theory, Behavioural Music Therapy employs different types of musical performance or listening as a stimulus cue or contingent reinforcement to alter behaviour (Madsen, Cotter, & Madsen, 1968). Lastly, there are various music therapy approaches that draw from a variety of theoretical frameworks.

For further information on music therapy paradigms, see Bruscia (1998) and Wigram, Nygaard Pedersen, and Bonde (2002). Alvin's Free Improvisation Therapy (1975) is a classic example of eclectic music therapy.

Child and adolescent populations have seen a lot of music therapy applications (Wigram & de Backer, 1999). In Austria, for instance, almost one-third of all music therapy roles are geared towards children and adolescents (Müller & Kehl, 1997). Many nations routinely treat psychopathology in children and adolescents with music therapy (Aldridge, di Franco, Ruud, & Wigram, 2001; Maranto, 1993).

No meta-analysis has been conducted on the effects of music therapy for children and adolescents with psychopathology, although there have been reviews on music therapy in the treatment of dementia (Koger, Chapin, & Brotons, 1999) and music in general medical treatment (Standley, 1986).

In order to help make educated decisions about treatment, this review aimed to carefully summarise past results on the effectiveness of music therapy in this sector. The purpose of this meta-analysis was to look at how well music therapy worked for kids and teens who had mental health issues. We also wanted to find out what factors, such as the client's age, the nature of the pathology, the music therapy approach, and the result type, affect the magnitude of the effect of music therapy.

2. Methodology

2.1 Literature Review

Potentially relevant studies included those that compared music therapy to no treatment, other treatments, or to a control group of children and adolescents with psychopathology, or that compared the two groups before and after music therapy. Eligible designs comprised pre-test-post-test designs involving simply the treatment group, as well as designs comparing the treatment group to a control group.

A comprehensive literature search was conducted using both electronic and manual methods. Music therap*, "crossed" with "child" or "effect" or their synonyms, was searched for in databases. We looked through issues of pertinent journals by hand. Both published and unpublished works, as well as documents in any language, were taken into consideration. Medline (1966–2000), Psynindex (1977–2000), PsycInfo (1887–2000), the Cochrane Library (2001, issue 3), Music Therapy Info CD-ROM 1 (1996), 2 (1999), and 3 (2001), a printed register of music therapy studies (Jellison, 2000), and various databases for ongoing and unpublished studies were among the databases searched. Programmes of music therapy conferences were also considered. There were a number of journals that were hand-searched: Music Therapy (1981–1996), Journal of Music Therapy (1964–2000), Music Therapy Perspectives (1982–2000), British Journal of Music Therapy (1968–2000), Nordic Journal of Music Therapy (1992–2000), Musiktherapeutische Umschau (1980–2000), and Revista Internacional Latinoamericana de Musicoterapia (1995–2000). Additionally, any additional research were found by checking the reference lists of the included papers.

With these search tactics, we were able to locate 29 studies that could be of use.

2.2 Eligibility requirements for research

Research that did not focus on music therapy as described above was not included. This includes studies that examined the impact of music education (Standley & Hughes, 1997) or music alone (Braithwaite & Sigafos,

1998; Cripe, 1986; Underhill, 1974). Research that looked at group dynamics rather than individual results (e.g., Gunsberg, 1988; Humpal, 1991) was not considered for inclusion because the emphasis was on changes in the individual that were clinically meaningful. We were unable to incorporate one study (Parker Hairston, 1990) due to the fact that it reported the combined effects of music therapy and another therapy, rather than the individual therapeutic outcomes of each.

The absence of a distinct psychopathology was the reason for the exclusion of two investigations (Harding & Ballard, 1982; Ulfarsdottir & Erwin, 1999). Exclusion criteria included the inability to calculate effect sizes in studies with only one subject (e.g., Bruscia, 1982; Wimmer-Illner, 1996). Two studies were omitted (Krout, 1987; Wylie, 1996) due to the fact that the outcome measures were too comparable to therapy sessions for the results to be considered objective. We did not include a paper if it did not provide all of the results of an outcome study (Standley & Hughes, 1996; Steele, 1977) or if we tried to get the missing information from the authors but were unsuccessful (Henderson, 1983; Lerner, 2001; Roskam, 1979). See Table 1 for study characteristics. Eleven papers were left out of the meta-analysis. From 1970 to 1998, these research were carried out. Eight of them took place in the United States, while the other three took place in the United Kingdom, Austria, and Germany. Clinical diagnosis covered a wide range, from behavioural abnormalities to developmental diseases. Developmental assessments, self-reports of self-esteem, and behavioural observations were among the outcomes. Several music therapy paradigms, or a combination of them, were used to provide music therapy in either group or individual settings. Participants in each study ranged from eight to twenty-six.

2.3 Processing and retrieval of data

The studies that were considered were coded in a methodical way. Information about the children's ages and genders, as well as their pathologies, interventions, comparison groups, outcomes, and publication status, was retrieved and organised.

The various psychopathologies were grouped into "behavioural disorders" (externalising disorders, such as conduct disorders, F91 in ICD-10), "emotional disorders" (internalising disorders, such as affective disorders, F3, and emotional disorders of childhood and adolescence, F93), "developmental disorders" (mental retardation, F7, disorders of psychological development, F80-F83, pervasive developmental disorders, F84), and a group of "mixed disorders" (when subjects with multiple diagnoses were included in a single study; this could also include comorbid conditions).

After the test and before the follow-up, the effects of the treatment were extracted independently. Effect sizes were determined by adjusting for changes that occurred before the test and then calculating standardised mean differences (Cohen's *d*) at the post-test.¹ To avoid unfairly rating studies based on their many outcomes, we averaged all of the outcomes when a study used more than one. The purpose of using Cohen's *d* was to ensure comparability, as it is the most popular effect size metric in psychotherapy research. To ensure an unbiased and conservative assessment, the effect sizes were additionally translated into Hedges' *g*, as Cohen's *d* tends to generate biased results in small samples. A fixed effects model was used to combine the effect sizes after they were weighted for sample size (see to the Appendix for details). For this reason, we consulted Borenstein and Rothstein (1999) and Cooper and Hedges (1994) before deciding to utilise *Q* tests to figure out how heterogeneous the studies were.

Because there were so few investigations, we opted to include one-group studies in the meta-analysis. Because the effects of one-group research would contain both treatment effects and changes over time that would have happened without music therapy, a systematic change in control groups could cast doubt on the reliability of comparing their results to those of two-group studies. For this reason, within-group effect sizes were used to compare the experimental and control conditions' temporal changes (Becker, 1988; see Appendix). In order to estimate the variance of an effect size, this approach requires knowledge about the correlation between the pre- and post-test results.

Where this association was unknown, researchers used an average of all known correlations for that condition and applied it to their study. Using ANOVA *Q* tests and subgroup analyses, we looked at how moderator variables affected the results (Borenstein & Rothstein, 1999).

Table 1. Identifying features of research using music therapy with youth

Author	Year	Country	Description	Subject	Delay
Aldridge et al.	1995	Germany	music therapy was administered to both groups using a crossover design.	developmental delay	independent; blind
Clendenon-Wallen	1991	USA	No Control Group	Sexual abuse autism	Self-report, independent
Eidson	1989	USA	no-treatment control; nonrandomised, matched age	Emotionally handicapped	Independent, not blind
Gregoire et al.	2019	UK	No control group	affective problems in gifted children	Self-report
Johnson	2020	USA	Music therapy vs other music	Juvenile delinquents, behavioural approach	Self -report
Michel & Martin (Michel & Farrell)	2021	USA	Non Treatment Control, Non Randomised	Mentally handicapped	Self -report, Teacher blinding unknown

Due to the small sample size, we opted to include only trials with a single treatment group in the meta-analysis. The results of one-group research would include both treatment effects and changes over time that would have happened without music therapy; hence, comparing them to two-group studies could be questioned if the control groups were changed in a systematic way. Hence, within-group effect sizes were used to analyse the changes over time in the experimental and control conditions (Becker, 1988; see Appendix). The approach requires knowledge of the correlation between the pre- and post-test data in order to determine the variance of the effect size.

When researchers did not have access to this particular connection, they averaged all known correlations for that condition and used that. Using ANOVA Q tests and subgroup analyses, we looked at how moderator variables affected the results (Borenstein & Rothstein, 1999).

3. RESULTS

Results from music therapy on average

At post-test, the average effect size of all the studies that were considered was $d = 0.99$ ($SE = 0.13$). This is a significant effect that differed significantly from zero ($t = 7.47$; $df = 243$; $p < .001$), according to Cohen's (1988) standards for interpretation and evaluation. Nevertheless, a substantial Q test for homogeneity ($\chi^2 = 88.02$; $df = 10$; $p < .001$) revealed that it was not statistically homogeneous. One outlying number was identified as the source of the variability upon examination of the results (Figure 1). Consequently, the study was not included in the analysis. As shown in Figure 1, the remaining research consistently indicate the effects of music therapy.

After removing Edgerton's study, the average impact size was $d = 0.61$ ($SE = 0.14$), which falls into the medium to big effect category. Hedges' conservative effect size index, after being controlled for bias, was 0.56 ($SE = 0.14$). Statistical significance was maintained in the results ($t = 4.37$; $df = 221$; $p < .001$), and there was no significant change in the results after removing Edgerton's study ($\chi^2 = 10.31$; $df = 9$; $p = .48$). Imperfect dependability of

outcome measurements reduces the observed effect magnitude (see Hunter & Schmidt, 1990). We used a conservative effect size estimate because reliability adjustment was not applied. While the majority of the primary studies did find an effect, the poor test power of these small-sample studies meant that only a small number of them were statistically significant (Figure 1). However, because to the significantly higher power produced by the meta-analysis's bigger total sample size, the summary effect size is highly significant.

Table 2 shows the outcomes of the examinations conducted under varied settings. If the control groups improved over time, then include one-group studies would result in biased conclusions. Clients receiving music therapy showed improvement, according to the weighted averages of the three conditions, whereas control group individuals showed no improvement across all circumstances. Table 1 shows that there were no significant variations in the categories of pathology, study designs, or the severity or persistence of the pathology. Thus, it seemed reasonable to include the one-group investigations.

Table 2. results of music therapy for kids and teens, broken down by study variables

Variable	N(studies)	N(subjects)	d	SE
<i>Diagnosis</i>				
<i>Emotional</i>	4	43	.27	.28
<i>Developmental</i>	2	37	.76	.38
<i>Behavioural</i>	4	37	.89	.29
<i>Mixed</i>	3	64	.93	.32
<i>Age</i>				.33
<i>Children</i>	5	61	.75	.28
<i>Adolescents</i>	6	116	.49	.24
<i>Approach</i>		83	.65	.30
<i>Behavioural</i>		48	.91	.19
<i>psychodynamic</i>		46	.71	.34
<i>Humanistic</i>		57	.53	.21
<i>Outcome</i>		59	.27	.18
<i>Social skill</i>		123	.93	.34
<i>Self-concept</i>		64	.58	.42
<i>Development</i>		39	.32	.22
<i>Behaviour</i>		48	.42	.19

4. Conclusion

This meta-analysis has important therapeutic implications for the treatment of psychopathology in children and adolescents, suggesting that music therapy can be an effective intervention. For this reason, music therapy is best used in clinical settings, where it can have a large and meaningful impact.

Music therapy may be helpful for some individuals, especially those who are dealing with developmental or behavioural issues, or who have more than one psychopathology. It appears that combining techniques from diverse music therapy systems is particularly useful for children and adolescents with psychopathology in music therapy.

There has to be more research on the efficacy of music therapy in clinical settings and on the models that are already used in Europe, according to our review. The therapeutic usefulness of the findings will be enhanced if they can be reproduced for different models and settings. Our research lays the groundwork for future, larger-scale investigations into music therapy for children. Studies that use larger samples will not only provide more reliable results, but they will also shed light on the interplay between the various variables. Additionally, it is critical to employ a variety of outcome measures to capture the full scope of the problems and the ways in which music therapy might help. In the expanding field of music therapy research, scales that measure overt behaviour and have been effectively utilised in earlier studies, like the Child Behaviour Checklist, are highly useful instruments for comparing study outcomes across studies. Music therapy studies should follow the general

requirements for clinical trials in terms of design and reporting in order to maximise the application of research results, regardless of the measure (cf. Moher, Schulz, & Altman, 2001).

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