

Emotional Effects of Active Music Therapy in Adults with Intellectual Disabilities: a Mixed-Methods Study

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Abstract

BACKGROUND. While numerous studies have highlighted the ability of music therapy to induce positive physiological and emotional changes, few have investigated the effects of active music therapy on the modulation of emotional states and general well-being in adults with mild intellectual disabilities.

PARTICIPANTS. The sample consisted of nine adults ($M = 34.3$; $SD = 7.1$) aged between 23 and 43, of whom 44.4 % were women.

METHOD. The intervention was designed to last ten weeks, with two 60-minute sessions of active music therapy per week. Sessions included rhythm activities, musical improvisation, analysis of song lyrics, and songwriting, followed by pre- and post-intervention assessments using standardised questionnaires and qualitative interviews. The data were analysed using the Wilcoxon test and a repeated-measures ANOVA.

RESULTS. Although no significant differences were found between pre- and post-intervention outcomes, the ANOVA showed significant improvements among the younger participants ($p = .003$). The qualitative analysis revealed a shift from negative to positive emotions during the music therapy sessions.

CONCLUSION. The results suggest that music therapy may have a positive, albeit not statistically significant, impact on participants' emotional regulation and well-being. Limitations include the sample size and the subjective nature of some of the data. Further research involving larger and more diverse samples is recommended to confirm these findings and explore additional applications of music therapy in clinical and therapeutic settings.

KEYWORDS:

Music Therapy; Intellectual Disabilities; Emotional Regulation; Adults; Well-Being.

Efectos emocionales de la musicoterapia activa en los adultos con discapacidad intelectual: un estudio de métodos mixtos

Resumen

ANTECEDENTES. Si bien numerosos estudios han destacado la capacidad de la musicoterapia para inducir cambios fisiológicos y emocionales positivos, no muchos han investigado los efectos de la musicoterapia activa en la modulación de los estados emocionales y el bienestar general en los adultos con diversidad funcional intelectual leve.

PARTICIPANTES. La muestra consistió en nueve personas adultas ($M = 34.3$; $DE = 7.1$) con edades entre 23 y 43 años, de los cuales el 44.4 % eran mujeres.

MÉTODO. El diseño de la intervención fue de diez semanas, con dos sesiones semanales de musicoterapia activa de 60 minutos. Las sesiones incluyeron actividades de ritmo, improvisación musical, análisis de letras y composición de canciones, seguidas de evaluaciones pre y post intervención utilizando cuestionarios estandarizados y entrevistas cualitativas. Los datos se analizaron mediante la prueba de Wilcoxon y un ANOVA de medidas repetidas.

RESULTADOS. Aunque no se encontraron diferencias significativas entre los resultados pre y post intervención, el ANOVA mostró mejoras significativas en los participantes más jóvenes ($p = .003$). El análisis cualitativo reveló una transferencia de las emociones negativas a las positivas durante las sesiones de musicoterapia.

CONCLUSIONES. Los resultados sugieren que la musicoterapia puede tener un impacto positivo, aunque no estadísticamente significativo, en la regulación emocional y el bienestar de los participantes. Las limitaciones incluyen el tamaño de la muestra y la subjetividad de algunos datos. Se recomienda más investigación con muestras más amplias y diversas para confirmar estos hallazgos y explorar aplicaciones adicionales de la musicoterapia en contextos clínicos y terapéuticos.

PALABRAS CLAVE:

musicoterapia; diversidad funcional intelectual; regulación emocional; adultos; bienestar.

INTRODUCTION

Music therapy has been widely recognised for its ability to bring about positive physiological, cognitive and emotional changes in a range of clinical and non-clinical populations (Fernández-Company et al., 2024; Freitas et al., 2022; Nevado Minaya & Fernández-Company,

2022; Stegemann et al., 2019). This discipline uses music for therapeutic purposes to address individuals' physical, emotional, cognitive and social needs, and is particularly valuable in contexts where verbal communication may be limited or impaired (Bruscia, 1998). In this regard, its application among people with intellectual disabilities is particularly significant, given that music acts as an alternative channel for communication and emotional expression.

Intellectual disability (ID) is characterised by significant limitations in both intellectual functioning and adaptive behaviour, which encompasses a range of social, conceptual and practical skills. These limitations emerge before the age of 18 (American Association on Intellectual and Developmental Disabilities [AAIDD], 2010). In Spain, it is estimated that over 400,000 people have some form of intellectual disability (Rodríguez Gregory & Tortosa Martínez, 2016), and a significant proportion of this population experiences difficulties in identifying, expressing and regulating emotions—key aspects for personal development and quality of life (Down España, 2018).

Emotional regulation is a fundamental process that enables individuals to manage their emotions in an adaptive manner and is particularly challenging for people with intellectual disabilities due to deficits in understanding emotions and basic social skills (Littlewood et al., 2018). Recent studies have shown that these emotional difficulties can lead to challenging behaviour, depression or anxiety if they are not properly addressed (Gur, 2016).

Furthermore, the literature highlights that people with intellectual disabilities often have reduced access to evidence-based psychological interventions, due to communication barriers, limited resources or a lack of specialised professionals (Hatton et al., 2018). In this regard, music therapy offers an accessible and adaptable alternative that enables emotional experiences to be integrated in a non-verbal way, which is particularly beneficial for this population (Wigram & Gold, 2006).

Active music therapy—in which participants do not merely listen to music but actively engage by playing instruments, improvising or composing songs—has proven to be an effective tool for fostering self-expression, emotional awareness and group cohesion (Geretsegger et al., 2017; Gold et al., 2009). This type of intervention enables the individual to create a symbolic space in which to process their emotions safely, through rhythm, timbre and musical structure.

From a psychobiological perspective, it has been noted that music activates areas of the brain associated with emotion, pleasure and motivation, such as the limbic system, the amygdala and the nucleus accumbens (Koelsch, 2014; Zatorre & Salimpoor, 2013). These activations have significant therapeutic implications, since they facilitate emotional processing even in people with cognitive impairment. Similarly, Chanda & Levitin (2013) have also argued that music can modulate

neurotransmitters such as dopamine, oxytocin and cortisol, thereby influencing mood, social bonding and stress reduction. Moreover, given that they possess greater neurocognitive flexibility, young people may experience greater benefits from participating in structured music programmes (Zatorre et al., 2007).

In addition, recent research has shown that music therapy can significantly reduce levels of anxiety and depression in people with intellectual disabilities, whilst improving their social interaction and sense of well-being (Moreno-Morales et al., 2020). These interventions also promote the development of basic social skills and emotional self-regulation, which are key aspects of everyday adaptive functioning (Saarikallio, 2010).

From another perspective, Gold et al. (2009) concluded that music therapy has moderate to high positive effects on emotional well-being, particularly in individuals with neuropsychiatric conditions or neurodevelopmental disorders. Similarly, the study by Aalbers et al. (2017) confirmed substantial improvements in emotional self-regulation following prolonged active music therapy interventions in psychiatric patients.

In the specific case of adults with intellectual disabilities, the amount of research remains limited. Nonetheless, some pioneering research has suggested that music can act as a mediator for emotional development and emotional support in group settings (Silverman, 2022, Raglio et al., 2015). These group settings foster the development of interpersonal dynamics that strengthen empathy, active listening and a sense of belonging—all of which are essential for communities that are often socially marginalised.

Building on these theoretical and empirical approaches, this study aims to explore the impact of active group music therapy on emotional regulation and general well-being among adults with mild intellectual disabilities, assessing both the quantitative and qualitative effects of the therapeutic process. This is an exploratory study for clinical purposes, the aim of which is to provide preliminary evidence to inform future, more structured therapeutic interventions and rigorous assessments of their efficacy.

MATERIALS AND METHOD

Participants and ethical approval

The study sample consisted of nine adults with mild intellectual disabilities, aged between 23 and 43 ($M = 34.3$; $SD = 7.1$), of whom four (44.4%) were women. All participants were users of an occupational centre. They lived with their families and attended the centre from Monday to Friday, where they took part in occupational workshops until the afternoon. The number

of participants was determined based on the number of adults with intellectual disabilities at the centre who wished to take part in the project on a voluntary basis, following informed consent from their families. The inclusion criteria for participation in the study were: people with mild to moderate intellectual disabilities, users of the occupational centre, people who had obtained consent from a parent or guardian to take part in the project, and people who wished to participate. The exclusion criteria were: people with severe intellectual disabilities, people whose parents or guardians had not given their consent for them to participate, and people who did not wish to participate. Participation in the study was conducted in accordance with the ethical principles set out in the Declaration of Helsinki (World Medical Association, 2001) and the Code of Ethics of the European Music Therapy Confederation (European Music Therapy Confederation, 2005). Participation was voluntary, anonymous and unpaid. The study was approved in advance by the Ethics Committee for Final Degree Projects of the Faculty of Social Sciences and Humanities at the International University of La Rioja (UNIR), thereby ensuring compliance with the required ethical and methodological standards.

Stimuli and measures

Stimuli. Specific activities were designed for the sessions with the aim of achieving the therapeutic goals set. The activities were divided into four sections: vocal, instrumental, improvisation and movement. Each section included a range of activities, such as playing the piano and singing, repeating rhythms, improvising with instruments, musical statues, and drawing what they feel whilst listening to music, amongst others. The instruments used included the piano, handpan, tambourines, bongos, djembe, woodblocks, sleigh bells, agogo bells, shakers, rainstick, claves, maracas, cowbell, loudspeaker, sheets of paper, coloured pencils, and coloured scarves.

Measures. To assess the effects of music therapy on emotional regulation and well-being in adults with mild intellectual disabilities, a mixed-methods approach was employed, combining quantitative and qualitative measures. With regard to quantitative measures, a pre- and post-intervention questionnaire (Fernández-Company & García-Rodríguez, 2024) was administered to observers (centre staff) to assess the participants' emotional states, communication skills, social interaction, cognitive functioning and motor coordination. These questionnaires used a Likert scale to assess changes in specific areas, such as emotional expression, attention and physical coordination.

In order to assess changes in emotional state, participants selected one of four emotions (happiness,

sadness, anger, fear) at the start and end of each session using visual aids. Furthermore, a Sankey diagram was used to illustrate the changes in emotional states throughout the sessions. Post-intervention interviews were also conducted to gather subjective experiences, including preferred activities (for example, vocal, instrumental, improvisation) and perceived benefits, whilst detailed field notes were taken to document behavioural responses, levels of participation and group dynamics during the activities (for example, improvisation, rhythmic exercises).

Procedure

The project was carried out at the Moixent Occupational Centre (Valencia). Before commencing, consent was obtained from the centre and the nine participants were selected. The families were contacted and provided with an informed consent form, explaining in detail what the project would involve. Once all the necessary permissions had been obtained, we proceeded to organise the activities, select the room for the sessions, determine the number of sessions and the days they would take place, and identify the materials required, amongst other matters. The room chosen at the occupational centre had natural light and enough space for the participants, as well as all the materials needed to conduct the sessions.

Ten music therapy sessions were scheduled, taking place during the last week of April and throughout May 2024. The sessions took place on Tuesdays and Fridays during the last week of April, and on Mondays and Wednesdays in May. Each session lasted one hour, from 10.00 am to 11.00 am. Each session was structured as follows:

- Ask them how they feel as they enter the session.
- Welcome song.
- Warm-up activities.
- Relaxation activities.
- Ask them how they feel at that moment, once all the activities have finished.
- Goodbye song.

The emotions expressed during all the sessions were: happiness, anger, fear and sadness. Before saying what emotion they were feeling, we went through them one by one so that they could really grasp each emotion.

Data Analysis

Various statistical tests were used to analyse the data. First, the non-parametric Wilcoxon test for paired

samples was used to compare the results before and after the intervention, assessing whether there were any significant differences in the quantitative results. A two-way analysis of variance (ANOVA) with repeated measures was then performed to examine how the time variables (pre- and post-test) and age influenced the dependent variable of emotional states. These tests made it possible to identify significant differences in the age variable and to explore the effectiveness of music therapy from both a statistical and a qualitative perspective.

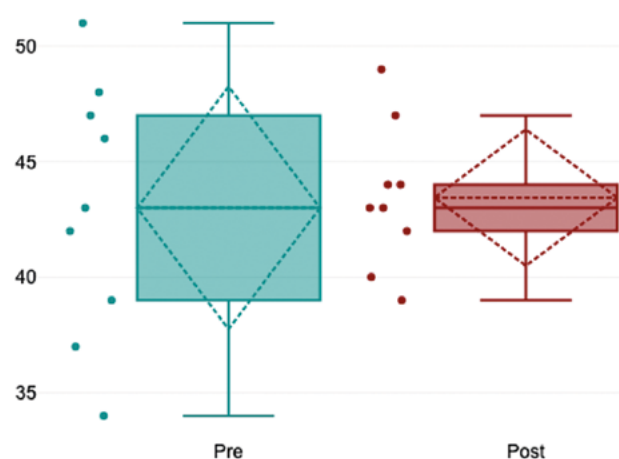
RESULTS

Table 1 and Figure 1 show the descriptive statistics for the results obtained pre- and post-music therapy intervention.

Table 1. Descriptive statistics of the pre- and post-music therapy results

	Pre	Post
Mean value	43	43.44
Standard deviation	5.57	3.13
Minimum	34	39
Maximum	51	49

Figure 1. Box plot of pre- and post-music therapy intervention



To determine whether there were any significant differences between the results pre- and post-music therapy intervention, the Wilcoxon non-parametric test for paired samples was carried out. Given that the 'Pre' group had a mean of $M = 43$ and that the 'Post' group also had a mean of $M = 43$, the null hypothesis that the 'Post' variable had a value less than or equal to the 'Pre' variable was tested using a one-tailed t test for paired samples, and the result was not statistically significant, $p = .472$ (see Table 2). Consequently, the null hypothesis was therefore upheld.

Table 2. Wilcoxon test statistics

	<i>W</i>	<i>z</i>	<i>p</i>	<i>r</i>
Post - Pre	17.5	-0.07	.472	0.02

Although the differences between the pre- and post-music therapy results were not significant, a two-way ANOVA with repeated measures was performed, which showed that there was indeed a significant difference between the groups for the first factor 'Age', 'Pre' and 'Post' in relation to the dependent variable of age, $p = .003$, with a moderate effect size ($\eta^2p = .57$) (Cohen, 1988) (see Tables 3 and 4).

Table 3. ANOVA test statistics

	Sum of squares	<i>df</i>	Mean squares	<i>F</i>	<i>p</i>	η^2	η^2p
Age, Pre, Post	474.96	2	237.48	9.36	.003	0.39	0.57
Sex	0.67	1	0.67	0.01	.911	0	0
RM Factor x Sex	26.5	2	13.25	0.52	.604	0.02	0.07
Residuals (Between Subjects)	345.85	7	49.41				
Residuals (Within Subjects)	355.2	14	25.37				

Table 4. Bonferroni post-hoc test results for the RM Factor

		Mean diff.	Std. Error	<i>t</i>	<i>p</i>	95 % CI lower limit	95 % CI upper limit
Age	Pre	-8.67	2.677	-3.237	.036	-14.84	-2.49
Age	Post	-9.11	2.579	-3.533	.023	-15.06	-3.16
Pre	Post	-0.44	1.444	-0.308	1	-3.78	2.89

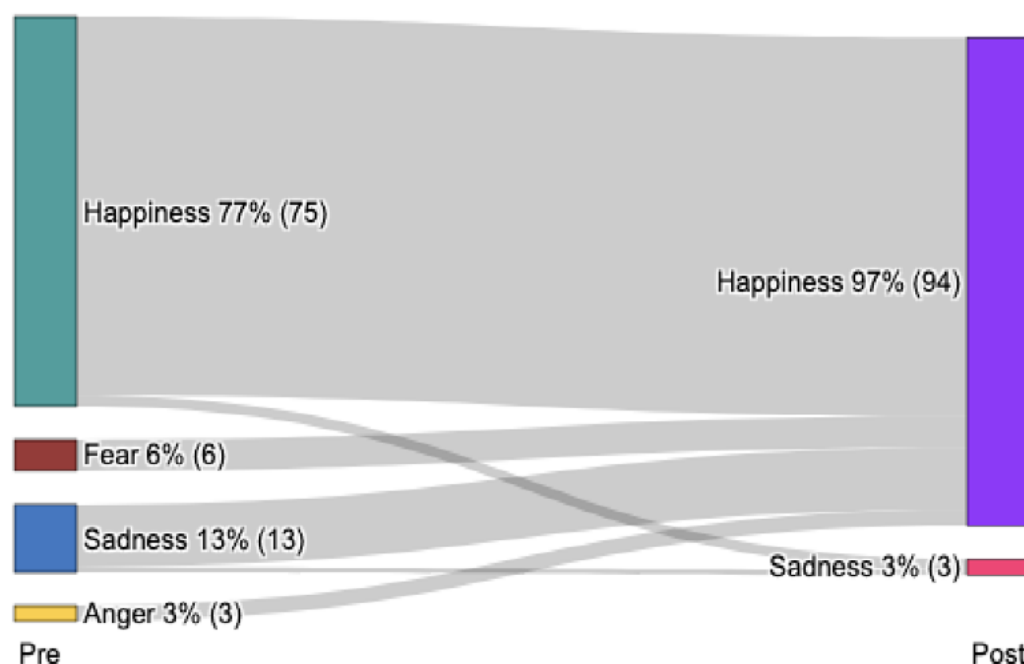
From a qualitative perspective, the Sankey diagram in Figure 2 shows that, for the most part, there is a shift in emotional states from before the beginning of the music therapy sessions—for example, from sadness, fear or anger—to happiness by the end of the sessions.

DISCUSSION AND CONCLUSIONS

The results of this study suggest that active music therapy can bring about positive emotional changes in adults with mild intellectual disabilities, although these changes did not reach statistical significance in the overall pre- and post-music therapy analysis. However, the repeated-measures analysis of variance (ANOVA) showed that younger participants exhibited a significant improvement in emotional indicators ($p = .003$), which suggests greater emotional receptivity or plasticity in this age group. This finding is consistent with previous studies which have suggested that young people, due to their greater neurocognitive flexibility, may benefit more significantly from structured musical interventions (Zatorre et al., 2007).

From a qualitative perspective, the results of the Sankey diagram reveal a clear pattern of emotional transfer: many participants reported negative emotional states such as sadness, anger or fear at the beginning

Figure 2. Sankey diagram of emotions pre- and post-music therapy



of the sessions, which gave way to more positive emotions, such as happiness or calm, by the end of the interventions. This transformation has been extensively documented in studies highlighting music's ability to regulate affective tone and facilitate emotional expression (Chanda & Levitin, 2013; Magee et al., 2016).

The lack of statistical significance in the overall pre and post-comparison can be explained, in part, by the small sample size ($n = 9$), which limits the study's statistical power. This is a common limitation in preliminary clinical studies, and suggests the need to replicate the findings in larger and more diverse samples. Furthermore, the subjective nature of some emotional assessments introduces a potential source of bias, although attempts were made to mitigate this effect through the triangulation of qualitative data.

The qualitative findings, however, are particularly revealing and consistent with the specialist literature. For example, Silverman (2022) highlights how group activities involving musical instruments foster a sense of belonging, self-esteem and interpersonal connection—all of which are essential for improving the subjective well-being of people with intellectual disabilities.

Another important point to note is the potential influence of the group format of the sessions. Social interaction mediated by music not only enhances the emotional experience, but also promotes prosocial behaviour and cooperation, as demonstrated in the research by Raglio et al. (2015). This social aspect of music therapy may have indirectly contributed to the emotional changes observed in the study.

Despite the promising findings observed in this study, it is necessary to consider a number of methodological limitations that may have influenced the results and which should be taken into account in future research. Firstly, the small sample size is a significant limitation. Although this type of exploratory study is usually conducted with small sample sizes, the small number of participants significantly reduces the statistical power of the analysis, which makes it difficult to detect significant effects and limits the generalisability of the findings to other populations. To overcome this limitation, future research should involve a larger number of participants from different centres, regions, and with different levels of intellectual disability, which would ensure that the results are more representative and robust.

Secondly, the absence of a control group makes it impossible to establish with certainty a causal relationship between the music therapy intervention and the emotional changes observed. Whilst pre- and post-tests can identify changes over time, they do not rule out the influence of external variables or placebo effects. In this regard, it is recommended that experimental designs be used, with participants randomly assigned to either the experimental group or the control group, which would allow for a direct and more accurate comparison of the therapeutic efficacy of music therapy with that of other interventions or with no intervention at all.

Moreover, the duration of the intervention—limited to ten sessions spread over five weeks—may be considered insufficient to bring about lasting or structural

emotional changes. Previous research suggests that the benefits of music therapy tend to become established in the medium to long term, particularly among people with intellectual disabilities, where learning and emotional regulation processes take longer. It is therefore advisable to implement more extensive, long-term programmes, with weekly sessions over several months, as well as conducting follow-up assessments three and six months after the end of treatment to assess the lasting effects achieved.

Another significant limitation lies in the subjective nature of some assessment tools. Although the study included qualitative observations and participants' self-reports, emotion identification was influenced by the therapist's interpretation and the participants' ability to express themselves, which may introduce bias. To address this issue, it would be desirable to include complementary techniques in future research, such as standardised scales of emotional regulation, structured behavioural records and psychophysiological measures (for example, heart rate or skin conductance response), in order to cross-validate the data and enhance the objectivity of the assessments. Furthermore, potential observer bias in the questionnaires was not assessed. Future studies should include self-report tools for participants.

Finally, the participants' previous musical background—that is, their level of affinity, motivation or experience with music—was not considered. These factors can have a significant impact on receptiveness and on the outcomes of the intervention. The inclusion of tools to assess the individual's previous relationship with music would enable the sessions to be tailored to participants' specific interests and allow for an analysis of potential moderating variables influencing the therapeutic effect.

Far from invalidating the findings, these limitations provide important guidelines for refining future studies in this area of research, enabling us to move towards a more accurate and context-sensitive understanding of the impact of music therapy on people with intellectual disabilities.

However, despite these limitations, the findings of this study provide preliminary evidence regarding the potential of active group music therapy as an intervention strategy to promote emotional regulation in adults with mild intellectual disabilities. Although the overall statistical analyses did not reveal any significant differences between the pre- and post-intervention periods, the repeated measures analysis revealed significant improvements in the younger participants, suggesting that age may be a factor influencing therapeutic efficacy.

As for age-related differences, it could be argued that younger adults tend to exhibit less emotional rigidity or have a shorter history of dysfunctional coping, which may explain why the effects of the intervention were

more evident in this group. This phenomenon was discussed by [Saarikallio \(2010\)](#), who highlights the role of music as the most common and effective strategy for emotional self-regulation among young adults compared to other groups.

Furthermore, the qualitative analysis yielded findings consistent with the scientific literature, revealing a clear emotional shift during the sessions: negative emotional states, such as sadness, fear or anger, gave way to more positive emotions, such as happiness and serenity. These emotional changes, observed through active musical interaction, confirm the value of music as a tool for self-expression, emotional containment, and the building of relationships in therapeutic settings.

Active music therapy is an effective means of facilitating emotional self-exploration, boosting self-esteem and improving the quality of life for people with intellectual disabilities. In addition to their direct therapeutic potential, group sessions promote socialisation, a sense of belonging and cooperation among participants—key factors in improving subjective well-being and social inclusion.

However, the results should be interpreted with caution, given the presence of methodological limitations that restrict the generalisability of the findings. It is essential to conduct future studies involving large, controlled samples and more sophisticated measurement tools, with greater methodological rigour. Nevertheless, the findings provide a solid foundation for the clinical application of music therapy in the field of disability, helping to cement its position as an evidence-based therapeutic discipline. In summary, although the overall quantitative results were not statistically significant, age-specific analyses and qualitative data support the hypothesis that active music therapy may be a valuable intervention for promoting emotional well-being in adults with intellectual disabilities. It is recommended that this line of research be continued using longitudinal designs, larger sample sizes and more specific assessment tools to capture short- and long-term emotional changes with greater sensitivity.

In conclusion, this study reinforces the idea that music is not only a form of art or entertainment, but also a profound means of emotional connection and personal transformation, which is particularly valuable for those groups whose ability to communicate is partially or completely impaired.

AI Use Statement

The author states that no AI has been used in the article.

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BIOGRAPHY

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