



Exploring the Influence of Parental Literacy Status on the Implementation of Dance Movement Therapy for Motor Skill Development in Children with Intellectual Disability in India

**Anita Nanda^{a*}, Mohammad Rizwaan^a,
Bibhuti Bhusan Mohapatra^b, Pranakrushna Das^a
and Archana Kumari Padhy^b**

^a School of Special Education, OPJS University, Churu, Rajasthan-331303, India.
^b DPMIASSE&T (Special B.Ed College), Kodala, Ganjam, Odisha-761032, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This paper focuses on examining the influence of parental literacy status in the implementation of Dance Movement Therapy (DMT) for the development of motor skills in children with intellectual disabilities in India. The study aims to explore the potential impact of parental literacy on engagement, participation, and outcomes of DMT interventions, ultimately informing strategies to optimize therapy effectiveness. The research incorporates the use of the Behavioral Assessment Scales for Indian Children with Mental Retardation (Basic-MR, Part A) to assess the impact of

*Corresponding author: Email: anitananda1964@gmail.com;

parental literacy on the outcomes of DMT interventions.

Literacy status of parents, particularly in low- and middle-income countries like India, can significantly affect various aspects of a child's development, including their access to education, healthcare, and therapies. However, there is limited research exploring the specific role of parental literacy in the context of DMT interventions for children with intellectual disabilities in India.

This study adopts a mixed-methods research design, combining quantitative measurements and qualitative insights. A sample of children with intellectual disabilities, aged between 7 and 15 years, will be recruited from special education schools from Odisha, India. The DMT intervention will be carried out over a designated period, with trained dance movement therapists tailoring the sessions to meet the individual needs and abilities of the children. The impact of the intervention will be evaluated using the Behavioral Assessment Scales for Indian Children with Mental Retardation (Basic-MR, Part A), which provides a comprehensive assessment of motor skills including locomotor and object control skills. Quantitative data, including pre- and post-intervention assessments, will be analyzed to determine the influence of parental literacy on motor skill development outcomes.

This study aims to enhance our understanding of how parental literacy status influences the implementation of DMT and motor skill development in children with intellectual disabilities in India. By recognizing the impact of parental literacy and addressing potential challenges, the study aims to optimize the effectiveness of DMT interventions for children with intellectual disabilities. The findings will have practical implications for therapists, educators, policymakers, and other stakeholders involved in culturally sensitive intervention programs, promoting comprehensive motor skill development in children with intellectual disabilities in India.

Keywords: *Dance movement therapy (DMT); parental literacy status; behavioral assessment scales; intellectual disability; motor skill.*

1. INTRODUCTION

Intellectual disability is a complex neuro-developmental disorder characterized by limitations in intellectual functioning and adaptive behavior. Children with intellectual disabilities often experience challenges in the development of motor skills, which can significantly impact their overall physical and cognitive abilities. In India, where the prevalence of intellectual disability is estimated to be around 1-3% of the population, there is a growing need for effective interventions to address the specific needs of children with this condition [1]. One such intervention gaining recognition is Dance Movement Therapy (DMT), which utilizes movement and dance to promote physical, emotional, and cognitive well-being. It offers a creative and engaging approach to enhancing motor skill development in children with intellectual disabilities [2].

While the effectiveness of DMT has been explored in various contexts, limited research exists on its application specifically for children with intellectual disabilities in India. However, the implementation of DMT for motor skill development in children with intellectual disability may be influenced by various factors, including the literacy status of parents. Parental literacy

defined as the ability to read and write, plays a crucial role in a child's overall development and can significantly impact their access to educational resources, healthcare services, and social support systems [3].

Furthermore, the role of parental literacy status in the implementation of DMT interventions remains relatively unexplored. Parental literacy, defined as the ability to read, write, and comprehend information, plays a crucial role in accessing resources, understanding therapeutic concepts, and supporting the therapy process. Understanding the influence of parental literacy on the implementation and outcomes of DMT can provide valuable insights for optimizing therapy effectiveness [4,5].

The influence of parental literacy status on the implementation of DMT for motor skill development in children with intellectual disability in India has not been extensively explored. Understanding this influence is important as it can shed light on the barriers and facilitators that parents with different literacy levels may encounter in accessing and participating in DMT programs [6,7].

This study aims to fill this research gap by exploring the influence of parental literacy status

on the implementation of DMT for motor skill development in children with intellectual disabilities in India. The research will utilize the Behavioral Assessment Scales for Indian Children with Mental Retardation (Basic-MR, Part A) as a standardized tool to assess motor skills before and after the DMT intervention. By investigating this association, we can gain insights into the specific challenges faced by parents with low literacy levels and develop strategies to enhance the effectiveness and inclusivity of DMT interventions for this population.

The significance of parental literacy status in the context of therapeutic interventions has been recognized in the literature. Studies have highlighted the importance of parental involvement, comprehension of therapy goals, and the ability to provide support and reinforcement outside of therapy sessions [8,9]. For example, a study by Green et al. [10] found that parental literacy was associated with greater engagement and adherence to therapy in children with developmental disabilities.

In the Indian context, where literacy rates can vary significantly across regions and socio-economic backgrounds, understanding the role of parental literacy becomes even more critical [11]. The influence of cultural factors, language proficiency, and educational attainment on parental involvement in therapy needs to be examined to develop tailored strategies for DMT implementation [12,13].

Therefore, this study aims to explore the influence of parental literacy status on the implementation of DMT for motor skill development in children with intellectual disabilities in India. By assessing the impact of parental literacy on therapy outcomes using the Basic-MR, Part A assessment, this research seeks to provide insights that can inform interventions, training programs, and policies aimed at optimizing DMT effectiveness for children with intellectual disabilities in India.

2. METHODS

2.1 Participants Selected for the Study

The population of the study was consisting of special school for children with intellectual disability where intellectual disable (mentally retarded) children are enrolled. The study was

conducted in "BALVIKAS" located near Kodola town of Ganjam district Odisha, India.

The population of the study was consisting of 40 intellectual disable special school children with intellectual disability. Out of 40 intellectual disable special school children, 20 children were selected for control group and the rest 20 was selected for experimental group. The control group consisted of a set up with parent without an education status (Non-educated parent) and the experimental group was consists of a set up with education status (educated parent) [14].

In the context of this study, the term "parental literacy status" refers to the level of literacy or reading and writing skills possessed by the parents of children with intellectual disabilities in India. It encompasses the ability of parents to read and comprehend written information, write effectively, and engage in tasks that require basic literacy skills. Parental literacy status can be categorized based on factors such as educational attainment, reading ability, and proficiency in the language used for communication and instruction. The study aims to examine how varying levels of parental literacy status may influence the implementation of Dance Movement Therapy (DMT) and its impact on motor skill development in children with intellectual disabilities.

Before implementing Dance Movement Therapy (DMT) for the proposed study, the researcher conducted a pre-assessment or pilot study to evaluate the reliability and validity of the Basic-MR tool.

2.2 Dance Movement Theory Programme

The duration and frequency of the dance/movement therapy interventions may vary depending on the specific needs of the child. Some studies have implemented dance movement therapy sessions for a few weeks, while others have provided interventions for several months. The frequency of sessions can also vary, with some studies providing weekly sessions and others providing daily sessions.

In our case, the dance movement therapy sessions were implemented for nine months. The first or initial assessment of the child is done before starting the teaching or training program; this is called baseline assessment. The next three assessments were performed at the end of every three months i.e. one quarter. Similarly,

three quarter was performed and the mean score was calculated by using appropriate tools. The duration of the research was determined based on the selected assessment tool, the Behavioural Assessment Scales for Indian children with Mental Retardation (Basic-MR), which recommends a nine-month timeframe for the proposed study. The research period aligns with the recommended duration to ensure a comprehensive and in-depth assessment of the participants' motor skill development. By adhering to the suggested timeframe, the study aims to capture meaningful changes and progress in motor skills over an appropriate duration. This approach allows for a robust evaluation of the impact of dance movement therapy (DMT) on the development of motor skills in children with mild intellectual disabilities.

2.3 Procedure for Implementation of Tool and Collection of Data

The following procedures were followed to collect the data. First of all, basic information was collected for all the children with mild intellectual disability enrolled in the control group setting and experimental group setting. After this, these children were subjected to our matching procedures to study the literacy status of parents on the implementation of Dance Movement Therapy (DMT) for motor skill development in children with intellectual disabilities in both the control group and experimental group. Thus, a total of 40 mild intellectual disability children were selected.

Before developing tools for the main study, the researcher conducted a pilot study with the parents and the special educator to finalize assessment tools. Based on the comprehensive review of literature, insights from the pilot study, and inputs from discussions with experts, the researcher ultimately developed the final tool. This refined tool consisted of 25 items that were specifically designed to effectively measure the various domains of motor skills relevant to the study objectives. The development of the final tool was a rigorous process that incorporated evidence-based approaches and expert input, enabling the researcher to create an assessment instrument that was valid, reliable, and specifically tailored to the needs of the study population.

After the identification of the participant, the motor skill of individual subjects was assessed by using the motor skill assessment scale by

using Behavioural Assessment Scales for Indian children with Mental Retardation (Basic-MR, Part-A). The observations were recorded on the observation sheet of the record booklet as per instructions given in the manual of the scale.

2.4 Statistical Analysis for Interpretation of Results

The tools to be used are mainly the available tools used by professionals in the field of intellectual disability. The motor development of mild intellectual disable children was reviewed in the light of the specific purpose of the present study and appropriate tools will be identified, developed, and administered.

The data has been analyzed by adopting descriptive statistical analysis and inferential statistical analysis.

The descriptive statistical analysis is shown in proper tabular forms. Statistical techniques such as percentages, Mean (M) & Standard deviation (S.D.) are used to test certain Hypotheses. The inferential statistical analysis includes testing of hypotheses keeping the objectives in mind. These hypotheses are tested with the help of relevant statistical methods such as ANOVA, Tukey's test, and t-test by using statistical software Minitab software version 17.3.0 [15].

3. RESULTS

The present study examined the influence of parental literacy status on the implementation of Dance Movement Therapy (DMT) for motor skill development in children with intellectual disabilities in India. The research was carried out by using the Behavioral Assessment Scales for Indian Children with Mental Retardation (Basic-MR, Part A) to assess the impact of parental literacy on the outcomes of DMT interventions.

In Table 1 the ANOVA summary for the impact of the education status of parents on Dance Movement Therapy (DMT) for motor skill development in children with intellectual disability is presented.

Tables 2 and 3 present a synthesized view of the impact of literacy or education status of parents on Dance Movement Therapy (DMT) for motor skill development in children with intellectual disability.

Table 1. ANOVA summary for the impact of the education status of parents on Dance Movement Therapy (DMT) for motor skill development in children with intellectual disability

Sr. No.	Source	DF	Adj SS	Adj MS	F-Value	P-Value
1	Literacy status of parent	2	379.6	189.82	14.94	0.000
2	Error	57	724.3	12.71		
3	Total	59	1103.9			

Significance level $\alpha = 0.05$

Table 2. Mean summary for the impact of the education status of parents on Dance Movement Therapy (DMT) for motor skill development in children with intellectual disability

Sr. No.	Literacy status of parent	N	Mean	Standard Deviation	95% Confidence Interval(CI)
1	Control group	20	41.450	3.471	(39.854, 43.046)
2	Educated	20	47.600	3.966	(46.004, 49.196)
3	Non-educated	20	44.850	3.216	(43.254, 46.446)

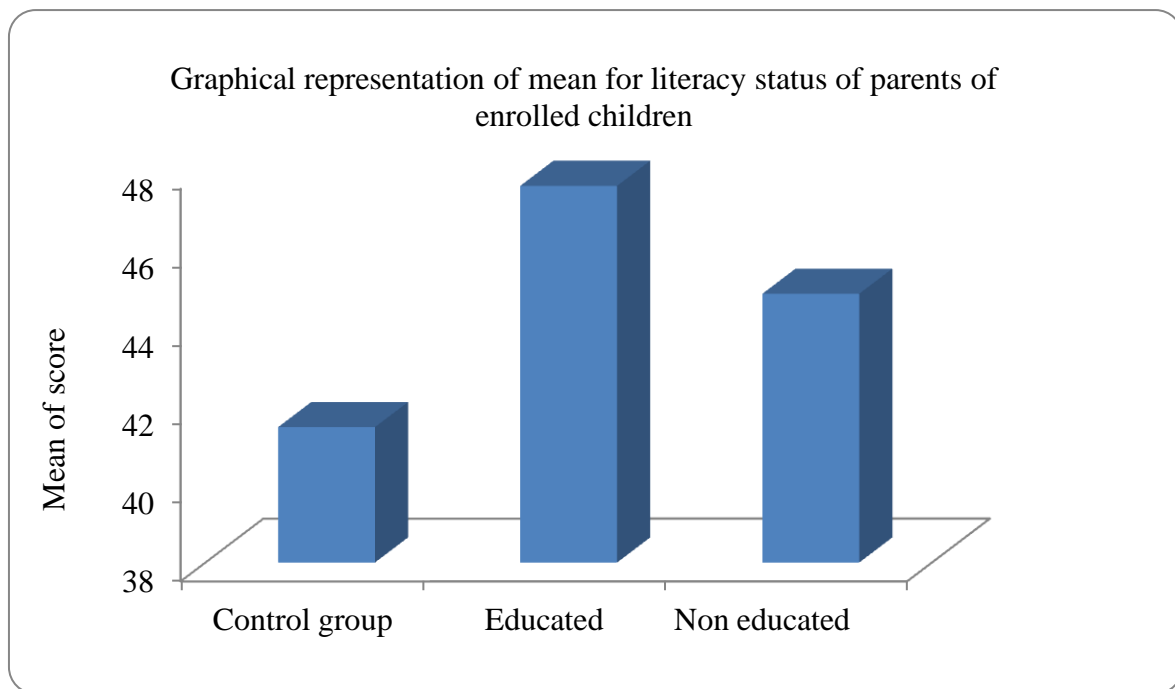


Fig. 1. Graphical representation of mean for literacy status of parents while implementing DMT for motor skill development in children with intellectual disability

Table 3. Tukey Simultaneous Tests for Differences of Means to study the impact of the education status of parents on Dance Movement Therapy (DMT) for motor skill development in children with intellectual disability

Sr. No.	Difference of levels	Difference of Means	SE of difference	95% Confidence Interval(CI)	T-Value	P Value
1	Educated - Control group	6.15	1.13	(3.44, 8.86)	5.46	0.000
2	Non-Educated - Control group	3.40	1.13	(0.69, 6.11)	3.02	0.011
3	Non-Educated - Educated	-2.75	1.13	(-5.46, -0.04)	-2.44	0.046

Significance level $\alpha = 0.05$

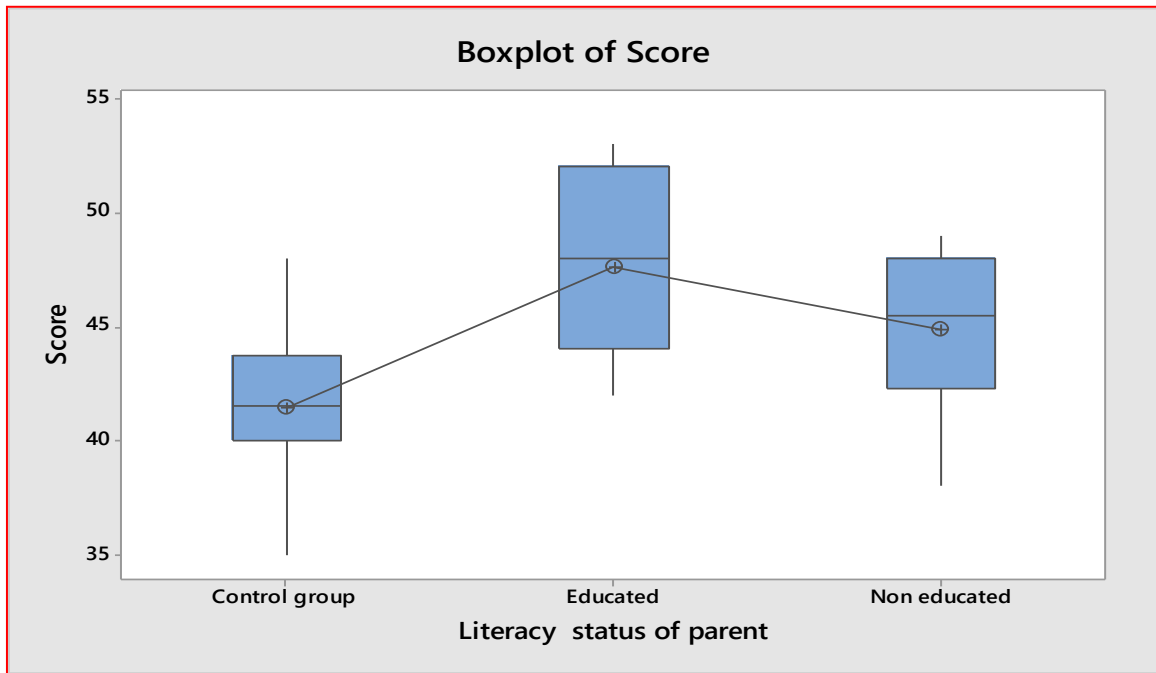


Fig. 2. Box plot of score obtained for the control group, with educated parent and Non-educated parent while implementing DMT for motor skill development in children with intellectual disability

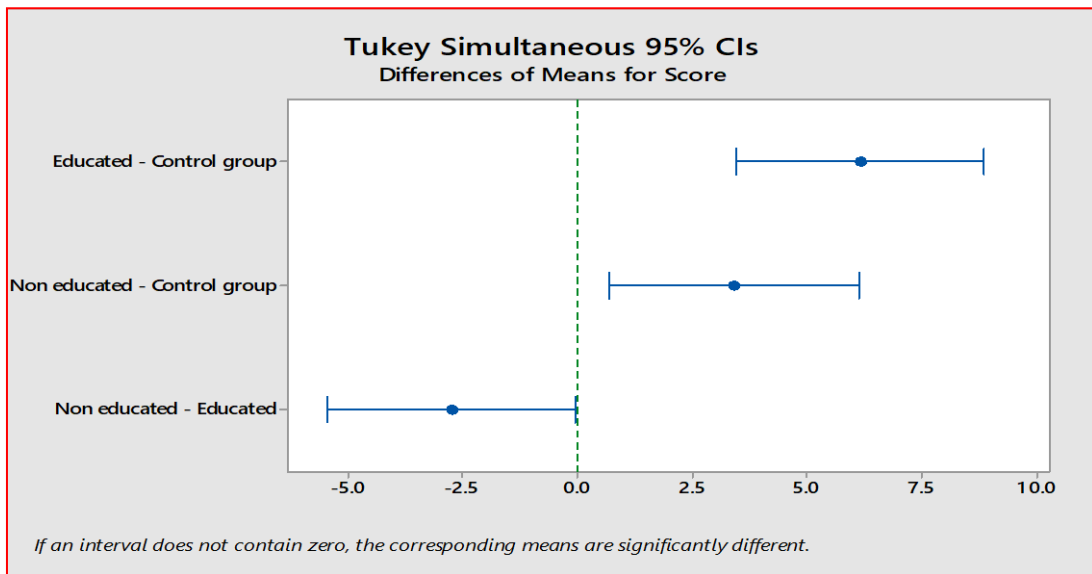


Fig. 3. Tukey Simultaneous plot for score obtained for the control group, with educated parent and Non-educated parent while implementing DMT for motor skill development in children with intellectual disability

The mean values of control group and experimental group (educated parents and Non-educated parents) are presented from the graphical presentation, box plot, and Tukey Simultaneous plot as shown in Fig. 1, Fig. 2, and Fig. 3.

4. DISCUSSION

The tables (Table 1, Table 2, and Table 3) present a synthesized view of the impact of literacy or education status of parents on Dance Movement Therapy (DMT) for motor skill

development in children with intellectual disability.

For comparison of means and to test the difference between the control group and the experimental group, the ANOVA test was used by using Minitab software version 17.3.0. The ANOVA test helped to understand the variability within each group as well as the differences between groups (control group and experimental group). This information can be useful in understanding the nature of the differences observed between groups and in answering the research questions.

It is apparent from Table 1 that the calculated F value ($F=14.94$) at 0.05 level of significance is significant in respect of determining the impact of literacy or education status of parents on the effectiveness of Dance Movement Therapy (DMT) for motor skill development in children with intellectual disability. The observed P value was 0.000 which is significantly higher than the corresponding level of significance (α) at 0.05. This signifies that the null hypothesis is rejected and the alternative hypothesis is true i.e. at least one mean is different from the control group and experimental group i.e. education status of parents (educated vs. non-educated). Moreover, a smaller F-value (14.94) indicated the degree of variability between the groups and within the groups was minimum or not significant.

The mean summary in Table 2 describes the mean of each group with a single value identifying the center of the data. The mean of each sample provides an estimate of each population mean. The differences between the sample means of the control group and experimental group (educated parents and Non-educated parents) are the estimates of the difference between the population means. The mean of the control group (41.450) is lower than the mean of the educated parents (47.660) and Non-educated parents (44.850). The observed lower mean in the control group is due to the role of the education status of parents towards motor skill development in children with intellectual disability by implementing DMT. However, the mean of educated parents (47.660) is found to be higher than Non-educated parents (44.850). The discussed difference in mean values of the control group and experimental group (educated parents and Non-educated parents) can be easily illustrated from the graphical presentation, box plot, and Tukey Simultaneous plot as shown in Fig. 1, Fig. 2 and Fig. 3.

The standard deviation is the most common measure of dispersion, or how spread out the data is around the mean. In the study, the observed smaller sample standard deviations of 3.471, 3.966, and 3.216 for the control group, educated parents and Non-educated parents result in more precise confidence intervals and higher statistical power.

In one-way ANOVA (analysis of variance), the confidence interval is useful for determining whether there is a significant difference between the means of two or more groups. In the study, the confidence intervals for the control group and experimental group (educated parents and Non-educate parents) did not overlap, which indicates that there is a significant difference between the means of these two groups. However, the means of educated parents and Non-educated parents overlaps, which indicates that even if there is a mean difference exists there is no significant difference between the means of these two groups.

Table 3 represented the Tukey Simultaneous Tests for Differences of Means to study the role of the education status of parents towards motor skill development in children with intellectual disability by implementing DMT. From the observed data it can be inferred that there were significant differences between the means of the control group and experimental group (educated parents and Non-educate parents) and educated parents vs. Non-educated parents at the confidence intervals of 0.05 and the means are significantly different from each other. The same was confirmed from the Tukey Simultaneous plot (Fig. 3) where the confidence interval of both the control group and experimental group (educated parents and Non-educated parents) does not contain zero confirming that there was a significant difference exists between the groups. However, the confidence interval of the educated parents and Non-educated parent just touch the line zero confirming that the mean difference exists but not on a larger scale.

The Tukey Simultaneous Tests for Differences of Means to study the role of the education status of parents towards motor skill development in children with intellectual disability represented the t-value and P-value [15]. The t-value and P-value provided stronger evidence for the rejection of the null hypothesis. The t-value is a measure of how many standard errors the sample mean is away from the hypothesized population mean. The observed lower t-value of

5.46 for educated parents vs. Control group indicated that the difference between the sample mean and the hypothesized population mean is not greater. Similar way, the observed t-value of 3.02 and -2.44 for Non-educated parents vs. the Control group and Non-educated parents vs. Educated parents group indicated that the difference between the sample mean and the hypothesized population mean is not greater.

Similarly, a lower p-value of 0.000 indicated that the observed sample mean is less likely to occur by chance, and therefore provides evidence against the null hypothesis. At a significance level of 0.05, if the p-value was less than 0.05, thus the null hypothesis was rejected, and it can be concluded that there was a significant difference between the control group and experimental group (educated parents and Non-educated parents) at the 0.05 level of significance. The mild intellectually disabled children in the experimental group showed better motor skill development in the presence of parents (educated parents and Non-educated parents) as compared to the control group.

Further, the difference in score between the control group and the experimental group (educated parents and Non-educated parents) and between the experimental group i.e. between educated parents and Non-educated parents was confirmed by using the Tukey Simultaneous Tests for Differences of Means (Table 3) [15]. The p-value of 0.000 between the control group and educated parents indicated that there was a significant difference in score between the control group and educated parents at the 0.05 level of significance. The p-value of 0.011 between the control group and Non-educated parents indicated that there was a significant difference in scores between the control group and Non-educated parents at the 0.05 level of significance. Similarly, the p-value of 0.046 between Non-educated and educated parents indicated that there was a significant difference in scores between the scores of Non-educated and educated parents at the 0.05 level of significance while studying the role of education status of parents towards motor skill development in children with intellectual disability.

The P value of the observed sample mean in all cases signifies that it is less likely to occur by chance, and therefore provides evidence against the null hypothesis. At a significance level of 0.05, if the p-value was less than 0.05, thus the

null hypothesis was rejected, and it can be concluded that there was a significant difference between the control group and experimental group (educated parents and Non-educated parents) at the 0.05 level of significance. Moreover, from the reported data it can be inferred that there was a significant difference between control groups vs. educated parents, control group vs. Non-educated parents, and Non-educated vs. educated parents. The mild intellectual disabled children in the experimental group showed better motor skill development in the presence of parents (educated parents and Non-educated parents) as compared to the control group. Further, it can be concluded that the effectiveness of DMT for motor skill development in children with an intellectual disability is better for educated parents as compared Non-educated parents.

There is a significant change in motor activity when compared with the effectiveness of DMTT in the presence or absence of parents. The observed difference might be due to the presence of parents. The effective implementation of DMT (Dance/Movement Therapy) sessions can have a significant impact on the therapeutic process and outcomes for children with intellectual disabilities. Research suggests that parental involvement in therapy can enhance the effectiveness of treatment and promote better outcomes for the child [2,4].

The same conclusion of the role of parents in DMT was reported by Fuentes, S et al. [16]. They found that when parents were present during DMT sessions, children with autism spectrum disorder (ASD) showed greater improvement in social skills and communication abilities compared to children whose parents were not present. This suggests that parental involvement can help facilitate the transfer of skills learned in therapy to real-life situations, as parents can reinforce and support their child's progress outside of therapy sessions.

Similarly, Torres [17] as well as Karkou et al. [18] explored the role of parents in different contexts of Dance Movement Therapy. The first reference focuses on parental involvement in DMT for children with autism spectrum disorder, while the second reference discusses the support provided to parents in neonatal units through DMT. Both articles provide insights into the importance of parental involvement and the positive impact it can have on therapeutic outcomes.

Research has shown that parental involvement in therapy, in general, can enhance treatment outcomes for children with intellectual disabilities. When parents are educated about the therapeutic approach and actively involved in their child's treatment, they can provide additional support and reinforcement of skills learned in therapy, which can help facilitate progress and promote better outcomes [19].

Furthermore, the presence of parents during therapy sessions can also help improve the therapeutic alliance between the therapist and the family. This can lead to better communication, increased trust, and more collaborative goal-setting, which can further enhance the effectiveness of therapy [20].

However, it's important to note that the presence of parents during DMT sessions may not be appropriate or beneficial for all children or families. Factors such as the child's individual needs and preferences, the parent's comfort level and availability, and the therapeutic goals and approach may influence whether parental involvement in therapy is recommended or effective [21].

However, noteworthy to highlight that while the presence of parents during DMT sessions may not always be necessary or appropriate, research suggests that it can have a significant impact on the therapeutic process and outcomes for children with intellectual disabilities, particularly in terms of promoting better social skills, communication abilities, motor skills and transfer of learned skills to real-life situations.

DMT is a therapeutic approach that uses movement and dance to promote emotional, cognitive, and physical integration in individuals. It has been found to be effective in improving various outcomes for children with intellectual disabilities, including motor skills, emotional regulation, and social skills. While a parent's education level may influence their ability to understand and support their child's therapy, it is not a determining factor in the effectiveness of DMT. DMT is often used as a complementary therapy alongside other interventions, such as speech therapy, occupational therapy, and behavioral therapy, to provide a holistic approach to a child's development.

It's important to note that the effectiveness of any therapy can be influenced by various factors, including the child's individual needs, the

therapist's training and experience, and the level of parental involvement and support. Therefore, it's best to consult with a qualified healthcare professional to determine the most appropriate and effective treatment approach for a child with an intellectual disability. However, the study concluded that the presence of educated parents showed better scores as compared to Non-educated parents. There is a significant difference exists between the mean scores of development/improvement of motor skills for children with mild intellectual disability studying in special schools after the implementation of Dance Movement Therapy (DMT) in the presence of parents.

5. CONCLUSION

The findings of this study will contribute to a deeper understanding of the role of parental literacy in the context of DMT implementation for motor skill development in children with intellectual disabilities in India. By examining factors such as parental understanding of therapy concepts, engagement in therapy sessions, and reinforcement of therapy goals at home, the study aimed to identify the potential impact of parental literacy on therapy effectiveness.

Through a mixed-methods research design, combining quantitative measurements and qualitative insights, the study recruited a sample of children with intellectual disabilities from special education schools in India. Trained dance movement therapists delivered tailored DMT interventions over a designated period, and the impact was evaluated using the Basic-MR, Part A assessment.

The study's findings will have important implications for intervention design, caregiver training, and the development of culturally sensitive strategies within DMT programs. By recognizing the role of parental literacy and addressing potential challenges, such as limited comprehension of therapy concepts or difficulties in reinforcing therapy goals at home, the effectiveness of DMT interventions for children with intellectual disabilities can be optimized.

Therapists, educators, policymakers, and other stakeholders involved in the design and implementation of interventions for children with intellectual disabilities in India will benefit from the research outcomes. The study aims to promote holistic motor skill development by

fostering parental involvement and support within DMT programs.

By highlighting the influence of parental literacy and addressing potential barriers, this research aims to contribute to the field of DMT interventions for children with intellectual disabilities. It emphasizes the importance of considering parental literacy status when designing and implementing interventions, ultimately improving the outcomes and effectiveness of DMT for motor skill development in this population in India.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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