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# Supporting attunement in the parent-child relationship through dance movement therapy: A pilot study on furthering the global development of neonatal intensive care unit graduate patients in India

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## Introduction

Dance Movement Therapy (DMT) is at a nascent stage in India and is not a service accessible in the perinatal and paediatric Neonatal Intensive Care Units (NICUs). DMT can provide interventions to meet an individual's personal, physical, emotional, biological, neurodevelopmental, and interpersonal needs. This study proposes that all families and infants could benefit from the supportive intervention DMT provides to the parent-child dyad. Care in a NICU only concerns itself with the physical milestones of the child and does not acknowledge the mental and emotional condition of the child. Each child who has stayed in the NICU has experienced separation from the mother (their primary caregiver). Most doctors, nurses, and other caregivers focus on infant irritability, poor sleep, feeding, or pain.

Dance movement therapy has many benefits. Cultivating attunement is one of these; employing movement as the primary source for connecting with another individual. DMPs can use their expertise in fostering attunement through movement interventions to help parent-child attachment and promote the parent's sense of self-efficacy and autonomy in examining their uniqueness and distinctiveness.

Currently, there are no documented studies with evidence of DMT interventions for pre-term or NICU babies and their families. This study aspires to be the pilot in this unexplored space. Infants experience extraordinary circumstances when admitted to the NICU. There is a cultural belief among doctors, parents and other care providers most parents are "coping well". All mothers whom we see 'coping' in the NICU or outside who come for postnatal visits do so at a sizeable personal cost. By providing a system that supports these parents, we may be able to establish or confirm their ability to generate positive attachments in their families to foster the growth of neurodevelopment in their infants. I understand this is largely due to the cultural stigma of parental

resistance to seeking help at the cost of their well-being. This study aims to highlight how supportive parenting programs can generate positive attachment patterns through attunement, which, in turn, may help develop an infant's neurobiological development. Helping parents see how pivotal their interaction is with their young ones can help with their parenting approach, thereby honing their capabilities in parenting their infant.

The following report outlines the aims and objectives of the study. It begins by delving into literature, examining the current scenario of Neonatal Intensive Care Units (NICU) in India. It then proceeds to explore the impact of separation (in the context of NICU) on child development. The report touches upon topics such as Parental Mental Health, Parent-Child Interaction, Neurological Development, and Attachment Theories to demonstrate how they have influenced the rationale for an intervention known as The Dancing Bond (TDB). The Dancing Bond (TDB) is presented as a Dance Movement Therapy (DMT) program for caregivers and babies to facilitate attunement towards neurobiological development. The literature review concludes by explaining why the sessions were conducted in a group and discusses group theories, movement analysis, and their benefits. The report then describes the methodology used for the study and finally concludes by presenting the data analysis, interpretation, discussion, and conclusion of the study.

**Aim and Objectives**

This pilot study explores whether DMT interventions can strengthen attachment and attunement, facilitating the child's global development (Blau & Reicher, 1995). Research shows how parents and caregivers interacting with their children can influence their neurological development (Gerhardt, 2014; Siegel & Bryson, 2012). Dance Movement Therapy recognises and responds to the non-verbal feelings of the growing child. It uses powerful tools such as mirroring, touch, games, rhythmic body actions, dance, music, and various interactive experiences (Erfer, 1995) that can aid the parent-child relationship. Kinaesthetic empathy and kinaesthetic seeing concepts proposed by Tortora (2006) also find value in developing such a program. There is still no research on how DMT can be valuable for parents and preterm infants who have graduated from the NICU.

This research aims to create an effective, evidence-based, methodological system for applying attunement as a DMT intervention to strengthen secure attachment for NICU graduates and their mothers/primary caregivers. It is anticipated that this study will pave the way to help standardise TDB™ as a structured program. The intention is to support the primary caregiver in building a strong connection between themselves and their child. This is particularly important for infants graduating from NICU, who lack the opportunities for this attachment and attunement in their early days. If the effectiveness of these techniques is proven, they can be used in training primary caregivers (usually mothers), enabling them to showcase their healthy and productive parenting journey and providing guidance to many other parents. Furthermore, DMTs can be trained to offer this intervention in similar settings to become members of TDB™ community already established from earlier practice.

Tortora (2006) cites Jones (1996), who describes how movement can help coordinate the connection between the brain and the body. She concludes that it can be surprising what we learn about their unison. Movement is important in the child's physical development (Chandler, 2016; Levy, 2017). I believe this can help parents attune with their children and understand their child's world, thereby reducing communication challenges that can be overwhelming.

This research aims to create new knowledge and flexibility in the already-known realms of parenting in Indian culture. Stern (1985) proposes that if the primary caretaker is observant and thoughtful about the baby, they can detect the child's needs and provide necessary attunement. Greater awareness of body and movement can be used as a communicative tool for the primary caregiver. TDB™ programs anecdotally have helped focus on parent-child rhythmic exchanges, which has improved the development of a child's brain and their attachment relationships, as also noted in Tortora (2006).

**Literature Review**

There is a plethora of literature available on DMT and parent-child dyads. However, the role of attunement in promoting secure attachment in young ones, to enhance their global development, hasn't yet been explored. The purpose of this research is to bridge this gap. The research can help understand how attunement methods employed in DMT can establish and build attunement to aid the parent/caregiver-child relationships. Just as there are medicines and vaccines for preventive health care, TDB™ attempts to be a preventive mental health-care model for children using an approach centred around the parent-child interaction.

*Neonatal Intensive Care Units in India*

As part of this literature review, the text highlights the neonatal care situation in India. According to the World Health Organization, out of 27 million babies born every year in India, 3.5 million babies are born premature (Anand & ET Health World, 2018). Over the last decade, India has grown in NICUs, significantly improving survival outcomes due to

trained medical and nursing staff (Nagesh, 2016). A meta-analysis by Khurana et al. (2020) concluded that early intervention programs, including occupational, speech, and physiotherapy for preterm infants, positively impact cognitive and motor outcomes during infancy, with benefits lasting into their preschool years. NICU graduates necessitate a multidisciplinary team to ensure holistic growth and development of the child. The guidelines of the Indian Academy of Paediatrics solely focus on aspects like weight gain and vaccines. Their annual guidelines state early childhood development (ECD); however, crucial elements essential for fostering comprehensive child development are absent (Bharadva et al., 2020).

*NICU Separation and Child Development*

Currently, care provided in the NICU focuses on the physical and medical needs of the child. However, little or no attention is given to the care of the mother's psychological well-being or the development of the mother-child bond. This lack of focus on the parent-child relationship in the NICU is a matter of urgency, as it can significantly impact the child's long-term development. Practices at the NICU clinics, such as skin-to-skin contact and kangaroo care (Conde-Agudelo et al., 2016), are explained once by the nurse or doctor to the mother and sometimes reinforced through a video. These are done to help the mother breastfeed, and again the focus being on the child's physical needs rather than psychological needs of the child via the development of attachment.

Attachment theory (Bowlby, 1969, 1988; Ainsworth, 1978) speaks about the unpleasant outcomes of separation between mother and child. Studies show that separation and hospitalization at birth adversely affect communication (Hauser & Dijk, 2016), parent-infant closeness (Feeley, et al., 2016), and disrupt mother-infant attachment (Brazelton & Cramer, 1990; Moran, et al., 1992; Ammaniti, 1991). Minde et al., (1989) in a longitudinal study point out that at four years, the likelihood of behaviour disorders was four times higher in premature infants. The quality of the relationship infants share with their primary caregivers is one of the most important environmental considerations known to be a mitigating or aggravating factor that deeply affects developmental trajectories (Givrad et al., 2021). Early interventions are important as a mother's limited or negative emotional reactions to her infant in NICU can lead to an increased risk of unbalanced attachment representation in the child's later life as outlined by Meijssen et al., (2011). Moutsiana et al. (2014) concluded that disturbances in a mother-infant relationship may persistently alter the neural circuitry of emotional regulation, with potentially adverse implications for adjustment to adversities in later life.

Child-parent relationship therapy (CPRT), developed by Landreth and Bratton (2006) is a develop mentally responsive counselling intervention grounded in the belief that an attuned and secure parent-child relationship is essential for a child's well-being as mentioned in (Carnes-Holt & Bratton, 2014). Furthermore, their study suggests that as an early intervention, CPRT can potentially interrupt the negative trajectory associated with externalized behavioural problems in early childhood, thereby preventing severe impairment later in life.

On similar lines, parent-child interaction therapy (PCIT) fosters sensory-motor regulation, through which therapists can learn to become attuned to parents and their children with the visceral experiences of reciprocity (van der Kolk, 2014).

In addition to the physical health risks, preterm infants are at a higher risk of social-emotional, language, mental, and motor developmental delays as well as awkward social interaction skills (Forcada- Guex et al., 2006; Smith, Landry & Swank, 2000). Early intervention programs for preterm infants positively influence cognitive and motor outcomes during infancy, with cognitive benefits persisting into the preschool age (Spittle et al., 2015). Baía et al., (2016) raise awareness towards the cruciality of reducing parental stress with the need to develop sensitive instruments that take notice of gender, social support and family-centred care. Early intervention which helps form healthy attachment patterns between infants and mothers is critical, as these patterns are repeated over a person's lifetime (Celebi, 2014). Evans et al. (2014) found that providing nurturing interventions to the mother and infant early on is a promising approach to help premature infants achieve social interaction patterns essential for their optimal development.

Grunau's (2013) study reveals that supported environmental care and parental involvement improve brain structure and activity among preterm babies who have experienced repeated pain/stress due to procedural interventions in the NICU.

Evans et al. (2014) conclude that integrated, diverse, and heterogeneous parenting programs focusing on cue-based, responsive care from the mother to her preterm infant are needed to improve the quality of the mother-preterm dyad.

The above studies help us to see that unusual and prolonged separation from a primary caregiver adversely impacts a child's development. This indicates a need to promote parent-infant closeness with guided parenting programs to support parent caregiving effectively.

***Attachment Theory***

In my practice as a psychologist, despite being well provided for, children (above the age of eight), as well as adolescents, appear to struggle with trauma and other psychological concerns. It is automatically assumed that if a child is not 'good' at something, it means they are 'not trying hard enough'. Over time, I have come to understand that these children are facing something called compound-attachment trauma (Lebow, 2021). Tracing this back to attachment theories and reviewing them has helped me further understand that insecure attachment is at the base of several adolescent traumas and psychological concerns. Bowlby developed his attachment theory to identify a connection to another human being. As an instinct that helps the vulnerably young to survive.

Bowlby's (2005) theory emphasizes the principle that a young child needs to develop a secure relationship with at least one primary caregiver for social and emotional development to occur normally and thus to survive. He highlights that we 'unconsciously internalize our individual early attachment experiences, and these determine our expectations in relationships with others as well as impact our capabilities as a learner' (2005, p.156). Our behavioural system develops from the attachment formed in the early years of our life through the responses we observe and receive from our primary caregiver, who in turn styles our innate uniqueness of how to cope with anxiety/threats when provoked. Van der Kolk et al., (2006) suggests vulnerability to Post-Traumatic Stress Disorder (PTSD) may be due to childhood trauma during the infant developmental pre-verbal phase. He describes the importance of the body and its ability to store and extract trauma, which is why DMT is so powerful as a body-movement intervention to help with connecting to individuals who may not be aware of the unconscious and/or pre-verbal trauma held in their bodies. Pareek and Joshi's (2018) findings suggest the significant role of early years attachment style with the caregiver in shaping the future trajectory of eating habits. This can further result in issues like obesity.

Bowlby explains attachment in four styles – secure, insecure, disorganized and ambivalent. Attachment disruptions at any developmental stage can hinder the all-round development of the child (Carnes-Holt & Bratton, 2014). Secure attachment is seen by Dozier and Sepulveda (2014) to have the best developmental outcomes by giving the best treatment response. Secure attachment has been discussed by Siegel and Hartzell (2004) as essential for the establishment of attunement. However, I agree more with Flacking et al. (2007) and Scheff (2004), who suggest that attunement and attachment are equal components to establishing a secure bond between the mother and infant. TDB™ is built on these foundational studies.

Encouraging and supporting secure attachment between the caregiver and child through attunement is at the core of TDB™. A parent's ability to connect empathetically to their child through the parent-child relationship, aids in the child's development of emotional self-regulation, age-appropriate social behaviours, and empathetic responses with their peers (Kilpatrtick, 2005; Liew et al., 2003; Valiente et al., 2004).

Through the above investigations, TDB™ hopes to culminate the above findings to create a sound parenting program that helps with parent-child attachment.

*Parent-Child Interaction and Neurological Development*

Most parents are unaware that early infant experiences play a significant role in shaping their children. My practice emphasizes neurological development because it is essential for Indian parents to understand how dynamic the workings of the brain are and how it markedly changes with learning.

Gerhardt (2014) quotes Russo et al. (2012) that 8% of people who have PTSD are linked to events in their babyhood. That is why it is extremely difficult for so many adults fraught with PTSD to overcome the trauma despite years of therapy and medication. She emphasizes that early experiences in childhood have a great impact on the infant's physiological systems. The growth of the brain happens at an exponential rate and its progress is deeply rooted in childhood; making it crucial for the child to grow up in the right environment (Gerhardt, 2014; Dimitri, 2011). TDB™ program helps parents to understand how attachment in the early years is imperative for unparalleled growth over the course of a child's life.

Secure attachment, as explained above, lays the foundation by the caregiver for the child having a secure base and a holding (Winnicott, 1971) environment for the child. Due to parents' poor response to the child's stimulus, the sympathetic and parasympathetic nervous systems have incomplete emotional regulation cycles, leading to organismic disturbances such as muscle tension, shallow breathing, and immune or hormonal disturbances (Gerhardt, 2014).

Siegel (2012) says that we can define the mind and outline practical steps for cultivating a healthy mind, something which develops across a lifespan. He organizes this through three fundamental principles, which state that human connections and relationships shape neural connections, and together, they shape the mind. Valiente et al. (2004) discuss how parental expressivity is important for children's learning and adaptive behaviour. They propose it can help contain children's over-arousal,

which has been shown to compromise and diminish their attention capacities, leading to high levels of negative emotions. The lack of 'social biofeedback' leaves the child with either avoidant or resistant attachment patterns (Gerhardt, 2014).

Through primary parent-child experiences, an infant understands the security of exploration in the holding environment. These positive experiences lead the infant to develop a secure attachment (Brazelton & Cramer, 1990). Through such positive experiences with the primary caregiver, the infant develops a sense of trust in relationships, thereby building trust in the environment at large (Tortora, 2006).

*The Rationale for The Dancing Bond*

Like the above interventions, TDB™ programs recognise the difficulties traditional parenting brings. However, TDB™ is unique in that it provides opportunities to improve attunement by showing new parents (not only those whose babies have been in NICU) how to attune to their infant through the body and movement while adding elements of play.

Movement has many restorative functions and is often used as a therapeutic tool while working with children (Capello, 2008). Movement enables children to freely express themselves, thereby creating a sense of security and trust in their natural environments by which they can further develop the ability to generate positive self-perception (Burrill, 2011; Loman, 1998).

In a therapeutic setting, 'attunement' is a process coined by Kestenberg (1975). Simply put, it means translating movement qualities observed in another person into one's body. Attunement helps us to feel the experience (Tortora, 2006) by gaining awareness of an adult or child by following their lead and trying to be 'in sync' (synchronise) with their actions. Meekums (2005) says that by tuning in to how the movement feels in our bodies, we become aware of what is being communicated. Attunement in DMT is fundamental since it helps the therapist to clearly understand the client's movement patterns, effort qualities, shapes, gestures, and postures, and above all, allows for a smooth opening into a person's inner world. While there is some research in this area, most of it is centred around mothers with mental health issues or children with learning or developmental disabilities in a Western context (Meekums, 1992; Rova & Haddow, 2017; Tortora, 2006; Manford, 2017; Sossin, 1999). Therefore, an exclusive study focusing on DMT-centred attunement with preterm children and their primary caregivers is needed. This study will be in India, which is culturally different from the West. Hence, findings shall be helpful to Indian paediatric professionals and policymakers.

Attunement is a process that cannot be compared to any other because it is the mode by which the caregiver can access the child's emotional state. TDB™ strives to create a constructive method for parents to connect with their children. This involves sound, movement, touch, and any other experience related to pleasure or displeasure that guides them regarding what to approach or avoid in the child's day-to-day functioning. Stern (1985) calls this "affect attunement" (p.140, Stern, 1985). Harvey (1995) points out that a parent who attunes to a child in his/her early formative years strongly impacts how the child experiences emotions later.

Rova and Haddow (2017) speak about supporting the mothers and babies in their group whilst attending to the sensitivities of non-verbal communication, creating opportunities for spontaneous joint movement and promoting bonding and attachment. TDB™, as an aspect of DMT can be the source of much-required advice, guidance, support, and therapy to families with children under five years old with emotional, behavioural, language, concentration, or other developmental issues that may be in the child's existing range of learning (Kestenberg Amighi et al., 1999).

Harvey (1995) acknowledges that mirroring to attune as an attachment technique, the emotional bond and the non-verbal communication pattern between the parent and the child become significant for each other. He supports the findings from Ainsworth (1978) and stresses that intimate patterns of later relationships are shaped by the ability of the parents to touch and hold their children during distressing phases of their lives. Berrol (2006) talks about how the brain activates the mirror neuron system, which leads to imitating actions and serves to identify emotions and feel empathy towards the other during the dyadic joint movement activity. Tortora (2009) suggests that it is this ability of the parents that supports the nonverbal qualities of the child's movement repertoire, which helps the child interpret and interact with the world.

Tortora and Whitley (2019) provide evidence of how the Ways of Seeing (WOS) co-treatment model created a safe holding environment to support the needs of each family member within the context of complex transgenerational transmission of family dynamics. Kedem and Regev (2021) observed that mothers experience a physical connection with their child. This connection allows them to explore the limits of their bodies, strengthens their sense of self, and contributes to the child's feelings of trust and safety with their primary caregiver, leading to an improvement in the relationship between the mother and child. The DOLPHIN program by Sravanti and Mundkur (2024) is a promising initiative that supports new parents in nurturing infants during the first two years. It has garnered positive feedback for fostering holistic child

development in the Indian context. Though elements such as tickling, which are a part of the program, are personally controversial for me, it reinforces early attachment and growth theories through evidence.

Building on the above theories, TDB™ program, which is the intervention in this study, offers DMT for NICU caregivers and babies to facilitate attunement and improve the relationship and thus the child's neurobiological development.

*Movement Analysis and Parent-Child Attunement*

In the field of therapy, it can be challenging to assess and quantify the quality of movements and movement-related interactions between therapists and clients. Laban (1988) defined 'Effort' as the internal drive from which movement originates. He identified four components of effort: Flow (bound, free), Weight (strong, light/passive), Time (sudden, sustained), and Space (flexible, direct). Ederhard-Kaechele (2007) focuses on shape-flow interventions, which enhance interpersonal relationships, and their use within the context of psychoeducation, movement metaphor, and methodological aspects. Influenced by the Laban-Bartenieff Movement Analysis system (Bartenieff & Lewis, 1980), Tortora (Tortora & Keren, 2022) developed a qualitative movement analysis tool for Dance Therapists working with parent-child pairs. This system is called Dyadic, Attachment-based, Nonverbal, Communicative Expressions (DANCE). The tool emphasizes nonverbal experiences, subtle qualitative aspects of nonverbal expression, and the practitioner's self-observations through movement and soma. I plan to use this tool to analyse the movements of mothers and children. My focus in this study has been on Efforts and shape-flow patterns, which will be further discussed in detail in the data analysis section.

*The Importance of Groups in TDB™*

TDB™ intervention program takes place in groups. Parent support groups are few in India. Indian society still looks upon the idea of adults seeking mental health support for themselves as taboo. Through my study, I would like to share literature that provides evidence of how powerful it can be for parents to share their combined experiences with other parents who may be going through similar journeys, so they feel less isolated. Through the interview process (please see methodology for more), it will be investigated whether this could lessen the loneliness that parents feel. Systemic thinking creates a significant shift from the individual to members of the family interacting with one another (Hedges, 2005). The families, caregivers, and professionals working together can bring the strengths of a systemic approach to the forefront.

A group setting has tremendous therapeutic power for mothers. Joint group purpose and experiences reduce stress and pressure, giving mothers a sense of belonging and trust (Yalom, 1970). It is important for mothers to view the group format positively as it improves sociality, a sense of belonging, and trust (Xie, 2020).

Carnes-Holt and Bratton (2014) emphasised group structure and confirmed that the supportive group format was a valuable component in the parents' success in learning the required attitudes and skills in communicating with their children with empathy.

Kedem and Regev (2021) mention mothers were thankful for the opportunity to be part of a group that brought about a sense of belonging, helped them think positively about their children and their relationship as well as lessened the feelings of stress and anxiety vis-a-vis their child's condition. While encouraging group work, Van Der Kolk (2014) beautifully elucidates that while playing together through improvisational exercises, we feel physically attuned and experience a sense of connection and joy. Therefore, a group will be the format for the TDB™ program in this study.

The literature review provided important insights into the role of attunement in promoting secure attachment in young children, with a specific focus on the parent-child relationship in the context of Dance Movement Therapy (DMT) and Neonatal Intensive Care Units (NICUs) in India. The review highlighted the lack of attention to psychological well-being and the development of the mother-child bond in NICUs, emphasizing the urgency to address this aspect to impact the long-term development of premature infants positively. The review also discussed the potential benefits of early intervention programs, such as occupational, speech, and physiotherapy, for preterm infants, emphasizing the importance of holistic growth and development through multidisciplinary follow-up services. Furthermore, the review shed light on the adverse effects of separation and hospitalization at birth on infant-mother attachment, as well as the potential long-term implications of disturbances in the mother-infant relationship on emotional regulation and developmental trajectories. It also discussed the significance of intervention programs such as Child-Parent Relationship Therapy (CPRT) and Parent-Child Interaction Therapy (PCIT) in promoting secure parent-child relationships and addressing behavioural problems in early childhood. In conclusion, the literature review underscored the critical need for a preventive mental health care model, centered around the parent-child interaction, especially in the context of NICUs, to support the psychological well-being and holistic development of premature infants. The review also highlighted the potential of early intervention programs and

therapeutic approaches to mitigate the adverse effects of premature birth on developmental outcomes. Further research in this area is warranted to explore and implement effective strategies for promoting secure attachment and optimal development in children born prematurely.

**Implications of the Literature Review for this Study**

The study aims to highlight the importance of attuned maternal care in the parent-child dyad for NICU graduates. It is anticipated that the research will contribute to the field of DMT by testing whether parent-child attunement through the intervention of the TDB™ program derived from DMT for NICU babies helps increase their mental and motor milestones

Cognitive difficulties are a common risk with preterm infants because of their neurological immaturity, in addition to the lack of knowledge and understanding (psychoeducation) of the family and community support. Despite medical advances in the care of preterm infants, the impact of this stress on infants and their parents is overlooked. This stress is considered one of the main complications among preterm infants, impacting their short-term and long-term growth, health and development (Montirosso & Provenzi, 2015).

This study is in response to the gap in literature around the implications for the mental well-being and global developmental milestones of NICU graduates through parent-child attunement and to help ease the current parenting struggles of NICU-graduate parents who have experienced unnatural separation from their children.

Therefore, the main research question for this study is, 'Does parent-child attunement through the intervention of DMT promoted as a TDB™ program for NICU babies enhance secure attachment, *which further leads to improved physical and mental milestones?*'

The following are the objectives of this proposed study that will help in answering the research question:

- To evaluate the outcome of applying attunement as a DMT intervention to strengthen secure attachment for NICU graduates and their mothers/primary caregivers.
- To explore if an increase in attachment leads to an increase in the development quotient of the children.
- To investigate the intersectionality of the increase in the quality of the relationship between parent-child and the increase in the child's developmental milestones.
- To evolve and spearhead a structured program termed "The Dancing Bond" which shall provide advice, guidance, and support in building attunement bonds within families to help with the growing child's emotional, behavioural, language, and cognitive development.

**Methodology**

Using the mixed-method approach (Mertens, 2015), instead of a single approach, for data collection and analysis is most appropriate for this research, as it will be able to address the research question fully and accurately. I will use a concurrent design that prioritises qualitative and quantitative data collected concurrently during the study. Concurrent design's purpose is to simultaneously collect data from both quantitative and qualitative scales, merge it, and use it to analyse results from the research problem (Creswell & Plano-Clark, 2011)

For the quantitative method of data collection, the following scale will be used:

- Developmental Assessment Scale for Indian Infants (DASII)

The DASII remains the mainstay for diagnostic affirmation for Indian toddlers and infants. It is the Indian adaptation of Bayley Scales of Infant Development, which is held up in its standard for assessment and is globally accepted (Madaan et al., 2021.)

For the qualitative method of data collection, the following technique was used to understand the group process in-depth:

- Self-developed qualitative interview for the participants to help understand their experience of TDB™ sessions.

After the interview, a play session before and after the DMT intervention group between the parent and child was video recorded to see any changes six weeks apart. For the videotaped sessions, the Dyadic Attachment-based Nonverbal Communicative Expressions (DANCE) tool (Tortora & Keren, 2022) was used to help systematically organize the nonverbal dynamics of the baby and mother's interactions. Based on the Laban System, D.A.N.C.E. introduces specific nonverbal analysis elements that are teachable to those unfamiliar with the Laban system. The "Ways of Seeing" program adapts these elements to create a systematic nonverbal analysis method, D.A.N.C.E., for observing individual and dyadic interactions. The therapist focuses on body actions, shapes, spatial aspects, movement rhythm, timing, and phrasing to analyze the attachment relationship. D.A.N.C.E. examines these elements dynamically to determine the attachment nature, guided by ten nonverbal categories: body, facial expressivity, eye gaze, body shapes, spatial use, movement quality, physical contact, movement tempo, vocal patterns, and coherence (Tortora & Keren, 2022). Multiple viewings of the videotape can help the qualitative elements become clearer. Video

is a retrospective analytical tool (Kennedy et al., 2015).

The quantitative scale DASII has a high- -reliability score of 0.88 for the motor scales and 0.91 for the mental scales. SPSS and Excel were used to collate and analyse the quantitative data. NVivo software was used to identify themes that emerged during the interview. For each dyad, the DANCE movement observation sheets were completed to observe interactive and attunement patterns in their bodies.

*Participants*

Eight full-term infants were recruited into two groups, comprising one experimental group and one control group:

1. NICU (Parent-child dyad) DMT group: NICU graduates who received DMT intervention (n=4)
2. NICU (Parent-child dyad) no-DMT group: NICU graduates who did not receive DMT intervention (n=4)

Once the group was formed, the structure was as follows:

1. Six sessions conducted for 50 minutes, with one weekly session.
2. The researcher led the groups. She is a qualified Dance Movement Psychotherapist and a trained rehabilitation psychologist in NICU clinics. She established goals to assist with data collection and analysis.

The criteria for inclusion in the trial were:

1. Infants born at or before 37 weeks of gestation period, OR
2. Infants born at 2500 grams or less
3. Mothers self-identified as primary caregivers of the infants

The following protocol was followed:

1. All participants were given a handout explaining the nature and intention of the research before recruitment to the study.
2. It was made clear that all their details would remain confidential and that their participation is voluntary.
3. Ethical approval was sought from the university.

*Phase 1: Before the intervention*

This phase was conducted with both the experimental and control groups. The quantitative and qualitative methods were performed. The clinical psychologist who conducted the DASII scale attended the pre-assessment meeting with all the participants. A short 7-minute free play between the mother and the baby was recorded at the end of the pre-assessment. Each play session was analysed.

*Phase 2: The Dancing Bond for the Experimental Group*

TDB™ program was conducted for mothers and their babies to help parents understand the proficiencies of attunement and how to incorporate it with their children. Each semester, a set of activity books and a theory guidebook was given to the parent. This interactive book can also be used to interact with their child. Each session lasted 50 minutes organically, witnessing the participation of the children.

*Phase 3: Post – Intervention Assessment*

After the six sessions were completed, the quantitative and qualitative tools were conducted using a similar process to the pre-intervention.

**Ethical considerations during data collection.**

To avoid examiner bias, the DASII scale, interviews, and video recordings were conducted by the clinical psychologist who works at the hospital. My role was solely that of the therapist, which has been very dear to me as a DMP and helped avoid any role conflict (Etherington, 2000). The study was designed with the help of my academic supervisors, keeping the participants' interests as the highest priority.

The University of Hertfordshire ethics panel reviewed and approved the study, written in detail to ensure ethical compliance. Privacy and confidentiality were the utmost priorities. The participants were fully informed of their rights and could withdraw from the study at any time.

As there were adult participants with their babies during the study, the parents gave consent on their behalf. The following protocols were followed:

- All participants were given a choice to be a part of the study or not.
- Only after the participants understood the study did they give their consent. They were encouraged to ask questions and be fully assured about the work.
- Participants were fully aware that they could leave the study at any point without any consequences or giving a reason.
- The participants knew it was not a paid contract; though they were offered travel costs, none requested reimbursement.
- The participants were aware of the study's confidentiality. When we met as a group, the confidentiality process was explained to the group, and an alliance was formed between all the mothers to protect data for each other's children.
- The participants were aware of how all the data would be anonymised and stored and how it would be used.

This pilot study was approved by the University of Hertfordshire ethics committee (Social Sciences, Arts & Humanities ECDA), and the protocol number is aSHE/PGR/UH/06024(3).

**COVID-19 Implications**.

Our babies were tiny, and some were at high risk of catching infections due to poorly developed immunity. Our COVID-19 protocol was very robust. All materials were sanitized before and after the children used them, and the room was sanitized just before the session. Since the babies were

uncomfortable with adults wearing masks, the mothers did not wear masks. If anyone was unwell, the session was not held.

**Comparative Analysis of Control and Experimental Groups**
**Quantitative Analysis**

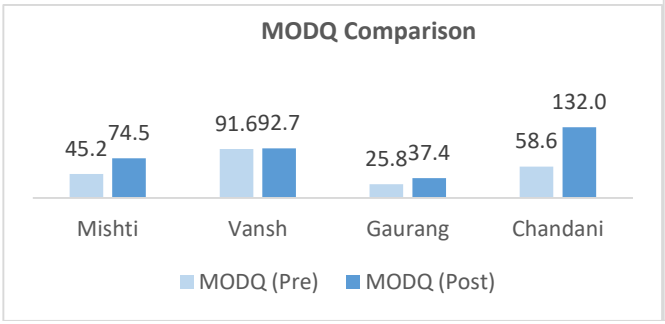
This analysis examines children's developmental progress in the experimental group (who received six parent-child dance therapy sessions) compared to the control group (who received no intervention). The data includes measures of Months of Age (MOA), Motor Development Quotient (MODQ), Mental Age (MEA), and Mental Development Quotient (MEDQ) pre-and post-intervention.

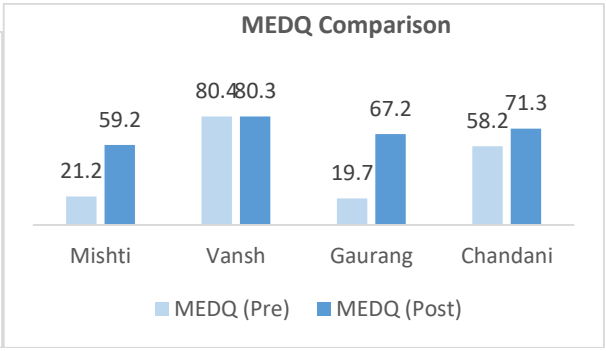
Participants in the study are as follows:
(Pseudonyms have been used to protect confidentiality)

| Name | Gender | Age at the start of the study | Birth Weight | Born at |
|---|---|---|---|---|
| Mishti (Exp) | Female | 18 months | 700 gms | 28 weeks |
| Vansh(Exp) | Male | 21 months | 2.39 kgs | 37 weeks |
| Gaurang (Exp) | Male | 23 months | 2.2 kgs | 37 weeks |
| Chandani (Exp) | Female | 14 months | 2 kg | 35 weeks |
| Rolini (Ctrl) | Female | 23 months | 2.25 | 36 weeks |
| Satya (Ctrl) | Male | 23 months | 3kgs | 37 weeks |
| Myra (Ctrl) | Female | 13 months | 3kg | 37 weeks |
| Ak (Ctrl) | Male | 23 months | 1.3 kg | 30 weeks |

Experimental Group Analysis
Pre-Test and Post-Test Comparison

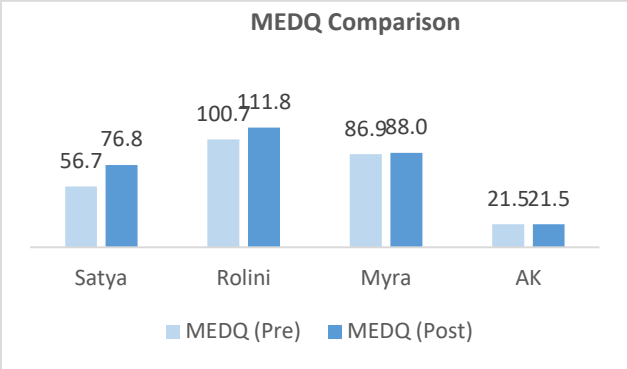
| Name | MOA (Pre) | MODQ (Pre) | MEA (Pre) | MEDQ (Pre) | MOA (Post) | MODQ (Post) | MEA (Post) | MEDQ (Post) |
|---|---|---|---|---|---|---|---|---|
| Mishti | 8m15d | 45.2 | 11m18d | 21.24 | 14m15d | 74.47 | 11m24d | 59.15 |
| Vansh | 19m24d | 91.6 | 16m9d | 80.4 | 22m27d | 92.7 | 19m27d | 80.29 |
| Gaurang | 6m18d | 25.75 | 4m6d | 19.66 | 10m12d | 37.38 | 18m15d | 67.23 |
| Chandani | 8m21d | 58.64 | 8m15d | 58.21 | 21m12d | 132 | 11m14d | 71.25 |

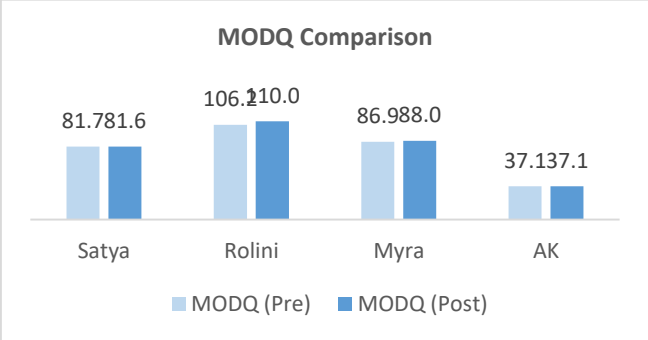



Control Group Analysis
Pre-Test and Post-Test Comparison

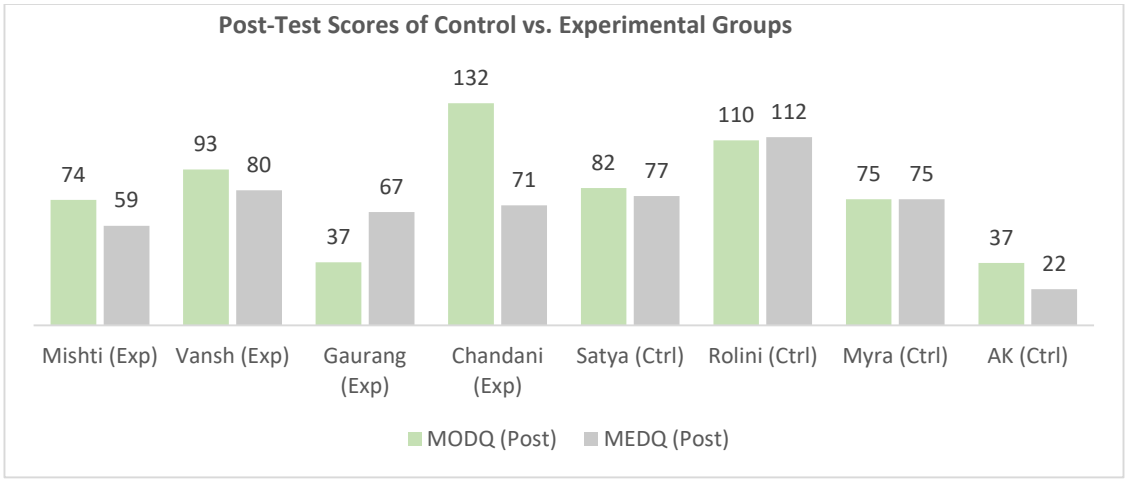
| Name | MOA (Pre) | MODQ (Pre) | MEA (Pre) | MEDQ (Pre) | MOA (Post) | MODQ (Post) | MEA (Post) | MEDQ (Post) |
|---|---|---|---|---|---|---|---|---|
| Satya | 19m6d | 81.66 | 18m6d | 77.5 | 19m6d | 81.6 | 19m21d | 76.84 |
| Rolini | 22m3d | 106.19 | 21m15d | 100.7 | 24m21d | 110 | 24m6d | 111.81 |
| Myra | 11m3d | 86.92 | 10m21d | 86.92 | 12m | 75 | 12m | 75 |
| AK | 8m9d | 37.08 | 5m18d | 21.5 | 8m9d | 37.08 | 5m18d | 21.5 |




Comparative Analysis: Post-Test Scores
Post-Test Scores of Control vs. Experimental Groups

| Group | MODQ (Post) | MEDQ (Post) |
|---|---|---|
| Mishti (Exp) | 74.47 | 59.15 |
| Vansh (Exp) | 92.7 | 80.29 |
| Gaurang (Exp) | 37.38 | 67.23 |
| Chandani (Exp) | 132 | 71.25 |
| Satya (Ctrl) | 81.6 | 76.84 |
| Rolini (Ctrl) | 110 | 111.81 |
| Myra (Ctrl) | 75 | 75 |
| AK (Ctrl) | 37.08 | 21.5 |




Key Comparisons:

- Mishti vs. Control Group: Mishti showed significant improvement in MEDQ compared to the control group.
- Vansh vs. Control Group: Vansh had stable scores similar to control participants like Satya and Rolini.
- Gaurang vs. Control Group: Gaurang showed a substantial increase in MEDQ, exceeding the control group participant scores.
- Chandani vs. Control Group: Chandani demonstrated remarkable improvement in MODQ, which was significantly higher than the control group.

Summary of Findings

1. Impact on the Experimental Group:
- Compared to their pre-test scores, there was a considerable improvement in MODQ and MEDQ amounts within the children in the experimental group who were a part of TDB™ sessions.
- This suggests that structured parent-child dance therapy (TDB ™) sessions positively impacted motor and mental development.

2. Impact on the Control Group:
- Within the children in the control group, developmental scores (MODQ and MEDQ) either did not change significantly or decreased slightly.

3. Significant Individual Reporting:

- Chandani and Mishti, in the experimental group, showed the most substantial improvements, particularly in their motor development.
- This suggests that the intervention positively affects motor development for some children.

Quantitative Data Summary

Comparison of the pre-and post-test scores indicates that the experimental group improved more than the control group, emphasising the benefits of this program.

The data indicates that the experimental group, which received the parent-child dance movement therapy sessions, experienced considerable developmental progress as compared to the control group, which received no intervention. This supports the sessions' efficacy in enhancing motor and mental development in young children.

**Qualitative Analysis:**

The qualitative data collection was divided into two parts.

- The first was to conduct an open-ended semi-structured interview, which lasted about 15-20 minutes per participant. This was done for all the participants before and after the study.
- The second was a seven-minute play movement observation of each parent-child dyad before and after the DMT intervention group. The movement analysis used the D.A.N.C.E Tool (Tortora & Keren, 2022).

The open-ended questions helped analyse the pre- and post-test interview data from both groups. Through thematic analysis, the following vital aspects came to the forefront: concerns and milestones identified by parents, changes observed after the intervention, and the perceived impact of attunement on their child.

Inter-group Comparison

- Developmental Milestone Concerns:
- Both groups were concerned about developmental milestones and their bond with their child. However, the experimental group had specific cognitive and interactional concerns addressed more effectively through targeted activities.
- Results Emerging:
- The experimental group reported significant improvements in interaction, communication, physical milestones, and emotional security. In contrast, the control group noted some physical progress but lacked the broader developmental and attunement benefits which were seen in the experimental group.
- Movement activities for engagement:
- The experimental group engaged in structured activities based on DMP principles, such as mirroring, joining with music, using props to engage, and sensory play, which were well-received and effective in fostering development. The control group primarily continued with routine activities without notable new interventions.
- Importance of Attunement and its impact:
- The experimental group showed marked improvement in attunement, with elements such as engagement, confidence, and communication increasing in their children, as reported by the parents. While recognising the importance of attunement, the control group reported a different level of progress.

Qualitative Data Summary

The analysis indicates that parent-child dance therapy sessions (experimental group) positively impacted children's developmental milestones, interaction abilities, and parent-child bond compared to the control group, which received no intervention. Structured, interactive activities enhance attunement and developmental progress more effectively than unstructured, routine activities.

**Movement Analysis:**

Experimental Group:

Gaurang:

The first observation found gaps in interaction and development between the baby and mother, with limited joint attention (lack of attunement), physical contact (separated kinesphere), and mutual play. The second observation showed improvements in movement, attention, closeness (merging kinesphere), and interactions (moments of attuned interaction). Despite progress, the mother's directives persisted. Overall, the second observation revealed more cohesive and supportive interaction, enhancing attachment and communication.

Mishti:

The first observation depicted a disjointed interaction (not merging of kinespheres), with the mother being passive (weight) and Mishti exploring independently (indirect space). There was minimal joint attention (lack of attunement), physical contact, and regulation, leading to a lack of coherent and complementary play. The second observation showed significant improvement in joint attention (attunement), physical proximity (merging kinesphere), movement quality (sustained movement), and interaction coherence. The mother adapted to Mishti's play themes, provided supportive co-regulation, and demonstrated a more synchronous and cooperative dyadic interaction.

Vansh:

The first observation showed the mother and Vansh engaging in play with restricted bound movements and minimal joint attention (not sustained attunement). The interactions lacked coherence, and the mother's quick, indirect play did not align well with Vansh's rhythm, which was still in pre-efforts.

Physical contact was limited to Vansh seeking proximity.

The second observation showed improved joint attention (increased attunement), more sustained and direct movements, and better regulation and coherence in their interactions. The mother adapted to Vansh's activities by engaging her whole body, creating a more engaging and interactive play environment with consistent physical contact and vocal engagement

Chandini:

In the first observation, the mother and child had minimal physical contact and movement (bound and restricted movement), with the mother staying out of the child's interactional space (out of baby's kinesphere) and providing quick, instructional play without sustained activities. The interactions lacked congruence, and the child focused more on toys than on the mother.

In the second observation, there was a marked improvement in interaction (more attuned play). The mother was more present and engaged, adapting to the child's play themes and creating a safe space for exploration. The mother and child exhibited more physical contact (merging Kinespheres), sustained (effort) activities, and a conversational, playful exchange, leading to better regulation, coherence, and synchrony in their interactions.

Control Group:

AK:

Both movement observation sheets show a consistent interaction pattern between the mother and the baby. In both observations, the mother used strong and direct movements, providing physical and verbal prompts to guide the baby's activities. The baby exhibited free and quick movements when given the chance, often met with the mother's frustration. The baby's indirect gaze and lack of sustained attention were met with the mother's direct and strong movements, causing disharmony and dysregulation.

Rolini:

The first and second observations showed joint attention between the mother and baby though not sustained (effort). Still, there were a lot of moments of play and interaction (attunement) between mother and Rolini. With more eye contact, physical engagement, and synchronized play. The mother followed Rolini's cues more effectively, creating a harmonious and dynamic environment (overall an attuned dyad).

Satya:

In both observations, the mother's interaction with Satya lacks coherence and emotional regulation, characterized by solid and direct movements and verbal instructions. The baby exhibits more exploratory behaviour (indirect effort), moving away from mother. The second observation shows increased frustration from the mother and more physical prompts, further reducing synchrony and harmony (Strong and direct efforts were more prominent).

Myra:

Both observations show limited body engagement, primarily using hands, with passive body weight from the mother. Facial expressivity and joint attention were minimal, with the mother seeking external validation and the baby seeking validation from the mother. Interactional space was close but lacked physical contact and moulding (body shaping). Nonverbal style was passive (weight), with the mother frequently explaining actions to the therapist. Regulation and coherence were present but minimal, with a harmonious yet incongruent interaction.

**Emergent Picture from Quantitative and Qualitative Tools:**

When comparing the quantitative and qualitative results of the study on The Dancing Bond program, it is evident that both data types present valuable insights. The quantitative results provide measurable data on the program's effectiveness, showcasing improvements in specific areas such as quality of interaction, joint attention, and developmental progress. These metrics offer clear and precise indicators of the program's impact. When comparing the qualitative and quantitative data, it is evident that they complement each other in providing a holistic understanding of the interactions. The qualitative data offers in-depth descriptions of the interactional dynamics, while the quantitative data provides measurable insights into specific behavioural patterns and frequencies. By integrating both qualitative and quantitative data, a comprehensive analysis of the interactions and their nuances can be achieved, leading to a better understanding of the mother-child dyadic interactions and their quality.

**Discussion:**

As Grunau's (2013) study revealed, a supportive environment enhances brain activity. The study reinforces that TDB can be a beneficial program for caregivers and their preterm babies to develop their brains, as seen in the improvement in mental milestones of the experimental group. Like Rova and Haddow's (2017) research on supporting mothers and babies, TDB demonstrates how a structured parent-child dance movement therapy program has supported and assisted some parents in the experimental group. This program furthers

interaction quality, joint attention, and overall attunement and developmental progress.

By using movement to attune, the mothers were able to engage with their children, which correlates to Burrill's (2011), Loman's (1998), and Capello's (2008) work and can be seen in the merging kinespheres exhibiting trust and security.

These positive experiences, reported by the parents, can be a pathway to developing a secure attachment in a holding environment, as explained by Brazelton and Cramer (1990). The group allowed the mothers to come together and joyfully observe their children through shared improvisational exercises (Van Der Kolk, 2014).

Over the last few years, I have been involved in developing and delivering TDB™. As part of this, I have created several activity books for parents to help them engage their children. I have developed five such books, each completed over ten sessions. However, the onset of the COVID-19 pandemic posed challenges, particularly for new mothers, especially those who had experienced high-risk pregnancies.

During one session, a baby named Gaurang accidentally hit his head while crawling, causing his mother to become very distressed and unable to participate in the session. Although Gaurang soon recovered and started engaging in activities, his mother remained tense and passive (use of bound and passive weight effort) throughout the session. At the end of the session, I sensed her unease and asked her how she felt. This led to her sharing her traumatic experience with Gaurang's complicated delivery and her fear of losing him. This prompted other mothers to join in and express their own feelings of grief and fear related to the separation experienced during the NICU stay. This collective sharing made us all realize the common fear of losing a child or facing future complications.

During the recruitment process for the program, I struggled with feelings of guilt as I couldn't stop questioning why some women had healthy babies while others did not. I discussed these concerns with my clinical supervisor, who suggested that I was experiencing something akin to survivor's guilt. This prompted me to delve into this privilege and seek a meaningful purpose for it.

I was particularly motivated to use my education to support the mental and developmental health of NICU parents, which led to the start of a pilot study. Despite the easing of COVID protocols, recruiting for the study proved challenging as families, especially those with high-risk deliveries, were understandably apprehensive. I felt despondent when met with hesitance from potential participants, as I believed the program could greatly benefit their children.

In India, while steps are being taken to care for pre-term babies, mental health topics remain taboo. Although doctors acknowledge the importance of the mother's mental health, they often hesitate to address it, fearing they might embarrass or disrespect the family. This results in a significant gap in the prioritization of mental and physical health, particularly for high-risk families.

Despite facing these obstacles, the pilot study eventually began. As the sessions progressed, I was happy and grateful to reach this milestone. I observed babies displaying natural curiosity towards each other, especially noting the close bond between two babies, Vansh and Mishti. All mothers in the group were supportive, fostering a non-judgmental environment and cheering on each other's children. This supportive atmosphere was evident in the final session when Mishti's mother requested to postpone due to work travel, and the group unanimously agreed, showcasing the harmony nurtured within the group.

At the end of the group, the mothers asked me if there would be more of these sessions and if fathers could come. I assured them that I would inform them when I resume sessions, and fathers would be welcome. Fathers help provide differential attachment functions, which can aid in developing pathways for the developmental outcomes of a "secure base" and a 'safe haven" (Verschueren, 2019). The presence of additional attachment figures in a child's life could lead to a wonderful experience for a child's brain maturation, and this is my hope.

**Limitations of Study:**

As promising and inspiring as the results appear in this study, one must be cautious as the study's sample size has been small, and data has also been collected from the same hospital. The families in this study all had similar socio-economic backgrounds of the middle or upper-middle class, giving them free time to participate in the study. The current study does not shed light on how culture, society, and belief systems play an integral role in the parenting journey for new parents and the formation of attachments. Which to the Indian culture is important.

**Suggestions for the Main Study**

Suggested changes for the main study would be:

- A 10-session group of six felt too short, but since it was the pilot, it was helpful to test the methodology, e.g., the data collection protocol.
- Having a small group worked for this client group. Therefore, a six to eight-day dyad group would be beneficial in creating a dynamic environment and providing individual attention to all the parent-child dyads.

- I would like to integrate a larger demographic, so I would approach some government hospitals where I could conduct the study.
- The group's timing should be about 50 minutes, as young children would start to get irritated after the 50-minute mark.
- Video recordings have been very helpful, and I would like to incorporate more movement analysis from watching the video, which I missed in this pilot. I hope the video can help me map more detailed progress.

**Conclusion**

This pilot is a novel way of working with premature babies in India. It is an unexplored territory, making me nervous and excited simultaneously. The study results were fresh and rousing to my work so far, which has often been met by discouragement by many people as working with such young children has yet to be heard of. Through the pilot study, we explored themes such as interaction quality, joint attention, and the children's overall attunement and developmental progress. It can be cautiously inferred that TDB positively impacted the experimental group, evident from the DASII results and the themes that emerged during the interviews. The interview themes were supported by changes in movement style, which were recorded and analysed using the DANCE tool (Tortora & Keren, 2022).

Though this program only focuses on the global development of the child, conversations with the mothers made me realise that their mental health was also compromised, and no care was taken for that. As this is not within the scope of this study, this is an area mental health practitioners need to explore. Only if we support the caregivers can our next generation be cared for.

The group's attendance was above 80%, demonstrating the group's usefulness and commitment (Payne & Brooks, 2019).

This pilot study has provided a pathway for parents to attend to their children earlier to help with their developmental milestones by attuning and connecting more effectively with their babies.

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