
Rhombencephalosynapsis and the Development of Motor Skills in Childhood Play: An Occupational Therapy Case Study

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Abstract

This case study presents a child with Rhombencephalosynapsis. The article describes motor impairments and functional abilities as they affect the development of play skills. It also describes the course and scope of occupational therapy treatment with implications for future intervention. The author's personal experience as a therapist is discussed as it is relevant to the treatment process. Neurological anomalies of the corpus callosum and cerebellum appear to cause motor planning difficulty, recurring falls and delayed emergence of hand dominance. These factors interfere with the development of motor play skills. Intervention focuses on improving functional motor ability in play, developing cognitive strategies to prevent injury, and providing education for fall prevention. The primary outcome is that physical safety becomes a priority in play. Parental involvement, emotional reactions to falls, and the role of spirituality are found to be significant components of the therapeutic process and should be addressed in the course of treatment.

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Play is well understood as being integral and essential to normal child development.

Play is addressed by the World Health Organization in its conceptual framework which defines and documents health, functioning and child development. Participation in different types of play (including motor, symbolic and pretend play) is classified as a component of learning and applying knowledge. Acquiring skills of basic learning may include use of toys, tools (such as pencils) and playing games (World Health Organization, 2007).

In the field of occupational therapy, play is viewed as central in early childhood intervention. Play is categorized as an occupation. It is a group of purposeful and meaningful activities which contribute to quality of life, and to a lifestyle which is both balanced and functional. Engaging in play provides opportunities for achieving health, well-being and participation in daily life activities (American Occupational Therapy Association, 2014).

Occupational therapy literature over the years has emphasized the role of play in the development of cognitive, social, emotional, and motor skills. The theoretical understanding of the concept of play provides a strong basis for practical implementation of occupational

therapy treatment approaches (Kramer & Hinojosa, 2010).

Rhombencephalosynapsis is a rare midline brain malformation. The defining features are missing or incomplete cerebellar vermis with apparent fusion of the cerebellar hemispheres. Diagnosis is determined on a spectrum of severity, ranging from mild to severe. It is seen in isolation or together with other nervous system malformations, such as multiple forebrain abnormalities and dysgenesis of the corpus callosum. Rhombencephalosynapsis can also be diagnosed in cases with additional structural anomalies (such as, anomalies in the nervous, cardiac, skeletal, pulmonary, renal, and other systems). Research subjects with more severe Rhombencephalosynapsis have shown more severely abnormal neurodevelopmental outcomes. Prevalence is unknown, though more than ninety individual cases have been documented. Etiology is unknown (Ishak et al., 2012).

Minimal research exists specifically on the Rhombencephalosynapsis diagnosis and its functional effects on early child development. However, there have been studies conducted on anomalies of the corpus callosum and their effect on motor development, which are relevant to this case. One such relevant study was conducted on agenesis (absence of

corpus callosum) and the establishment of hand dominance. The findings indicate that the corpus callosum has a role in the development of bimanual coordination. Furthermore, motor coordination and handedness are likely to be delayed in partial and complete absence of the corpus callosum (Sacco, Moutard, & Fagard, 2006).

Neuroplasticity in cases of dysgenesis of the corpus callosum was explored in a study of human brain imaging (Tovar-Moll et al., 2007). Neuroplasticity refers to the ability of the nervous system to reorganize and to create new pathways. In reaction to environmental factors, plasticity is explained as a basic characteristic of the nervous system which enables the potential for adaptation in its structure as well as in its function. In this study, evidence was found to support neuroplasticity in cases of limited ability of corpus callosum fibers to cross the midline of the brain (Tovar-Moll et al., 2007).

This study (1) describes the neurological condition of Rhombencephalosynapsis; (2) presents a case study of a four and a half year old boy with Rhombencephalosynapsis, including a description of his motor impairments and functional abilities, as they affect the development of play skills; (3) describes the course and scope of occupational

therapy treatment in this specific case, with implications for future intervention with children diagnosed with corpus callosum and cerebellum brain structure anomalies; (4) shares the author's personal experience as a therapist and describes the inspiration she discovered in this child's unique case.

Background

Medical and developmental History

David was referred to occupational therapy treatment at age four and a half years. He was diagnosed with prenatal brain structure anomaly during a routine pregnancy ultrasound at 15 weeks. He was born at 36 weeks, in a regular birth, weight 3100 grams, Apgar score 9/9. After initial minor nursing difficulties due to weak suck, he breastfed successfully and demonstrated normal infant feeding skills. Following a series of medical consultations, he was diagnosed at age seven months with Rhombencephalosynapsis. The symptoms included dysgenesis of the corpus callosum (with a relatively thin and narrow structure) and hypoplasia of the cerebellar vermis. No other structural anomalies were found. Developmental gross motor skills were delayed. David was treated by physiotherapy starting from age two months. He acquired all developmental motor milestones,

although with delays. He began to crawl with reciprocal movements at age one year and began walking at age one year and five months. The physiotherapy reports describe that David used instinctive protective reactions to prevent injury from falls, such as extending both hands. Furthermore, he initiated and developed cognitive strategies to compensate for instability, such as holding onto furniture and leaning on walls for increased support. Incidence of falls decreased over time but did not cease completely. His parents took him to local walk-in emergency care on repeated occasions because of lacerations and suspected concussion following accidental falls. He is not diagnosed with epilepsy, although he did experience two seizures due to high fever, unrelated to his neurological diagnosis. He did not experience falls during these isolated seizures. By age three years and 11 months he had reached all major motor milestones and was discharged from physiotherapy. Early speech and language development was also delayed. David displayed age appropriate communication and comprehension abilities, however he had difficulty with expressive speech. He was followed by speech therapy from age four months to age one year and five months. Repeated hearing tests confirmed normal hearing ability. Repeated ophthalmological consultations confirmed normal optic nerve structure and normal vision. David

was described by his parents to be a sweet, happy and communicative baby and toddler. David's progress has been, and continues to be, followed by his developmental doctor.

Family, Community and Cultural Environment

David lives with his parents and siblings in a town in central Israel. His mother tongue is Hebrew. His siblings are all healthy and attend regular school settings. The family identifies as religious Jews. Their choices of education, occupations, engagement in cultural activities and participation in community life are consistent with the orthodox Jewish lifestyle. Their spiritual faith is central to their personal and communal lives. They believe strongly in the positive power of prayer and blessings. Their religious belief system provides them with guidance and comfort.

Occupational Therapy Intervention

At age four and a half, David's parents requested a referral from their pediatrician for occupational therapy. Their reasons for seeking intervention were general clumsy behavior, lack of emergence of hand dominance, as well as continuing falls (from seated positions and during gross motor play).

Occupational therapy Evaluation

An occupational therapy evaluation was performed at the local clinic of the family's public health fund. According to the written report, the assessment was based on a parent questionnaire, a teacher questionnaire and an occupational therapy assessment form for children aged 3-6. The summarized findings indicate that David participated well in all the activities. Cognitive and academic abilities are noted as age appropriate. Mild motor functional difficulties were observed in tasks of balance and stability, in addition to muscle weakness and a tendency to tire quickly (i.e. jumping on two feet, walking a straight line, and tossing/catching a ball). David displayed difficulty maintaining a stable sitting position. He tended to lean forward on the table and to shift his body in the chair. Regarding hand function, qualitative observations noted signs of hand tremor and difficulty applying sufficient force during fine motor tasks (i.e. building with blocks and threading beads). He displayed difficulty performing scissor tasks. Drawing skills are described as delayed for his age. David did not maintain a functional pencil grip; no hand dominance, rather he transferred the pencil between his two hands, constantly shifting the positioning of his fingers. David did not know how to draw a picture of a child. He performed remarkably well

copying shapes on the Beery-Buktenica Developmental Test of Visual-Motor Integration, scoring in the 73rd percentile (Beery, Buktenica, & Beery, 2010).

Based on the above findings, the evaluator recommended a series of 10 weekly occupational therapy sessions. The public health fund provided coverage for treatment. The evaluation report suggested the following general recommendations for treatment to improve functional abilities: The therapist will observe and treat David's risk for falls, seating habits and signs of hand dominance; The therapist will provide David with opportunities to practice and improve age appropriate motor tasks and activities; The therapist will provide David with training to maintain body positions during motor activities.

Specific treatment goals were not detailed in the evaluation report. Rather goals were expected to be set at the start of the treatment by the therapist and the client.

Occupational therapy Treatment

According to the above recommendation, David was referred to a local facility for child development which provides multi-disciplinary intervention for children ages zero to nine years. David received coverage by the public

health fund for a series of 10 weekly occupational therapy sessions of 45 minutes each. At his point in time, David was four years and seven months old.

At the start of treatment, the occupational therapist began to establish a pleasant rapport with David and his mother. The therapist reviewed the evaluation report with them and explained the scope of occupational therapy intervention in this case. At this time, David's occupational profile was reviewed and detailed. The following information in his occupational profile was relevant in establishing treatment goals.

Occupational Profile

Education

David stayed at home in the care of his parents during his infant and toddler years. At age three years, he started to attend a regular half-day preschool program. At age four and a half years, he currently attends a regular half day kindergarten for boys, four to five years of age. The following information is based on teacher questionnaire. His teacher describes him as a happy, smart, curious child with a pleasant disposition. He participates well in learning and play activities. He performs at age appropriate levels in the areas of attentional skills, comprehension,

language and communication, social interaction, eating and sensory processing. Fine motor tabletop activities in class are difficult for David, as compared to his peers. He requires more time and practice than his peers to develop functional pencil grip, scissor grip, and manipulation of small toys such as puzzle pieces and building blocks. According to his teacher, his current fine motor performance is at the same level as that of his peers. He often falls after bumping into objects in the classroom space. He has difficulty in individual and group gross motor play, including running, jumping and ball-playing. Participation in these activities seems to require great effort, according to teacher observation. There is a tendency for frequent falls during gross motor activities.

Leisure

David participates in a range of different types of play at home during the afternoons. He enjoys imagination games, building blocks, drawing, and arts and crafts. He often plays with his siblings at home. When David is engaged in play activities, he occasionally falls while sitting on his chair, or while he is in motion during games that involve movement in space. David's family does not have a television, computer or any other digital screens. Therefore, David is not

exposed to screen time and does not experience this type of leisure activity.

Basic Activities of Daily Living (BADL)

David eats well, although he tends not to sit straight at the table during mealtime. This puts him at risk for falling from his chair. He requires moderate assistance with dressing. He requires moderate assistance and supervision with bathing. He generally has good sleep habits and his parents encourage consistency in his sleep routines. He wakes up easily in the mornings, naps in the afternoons, falls asleep easily in evenings, and sleeps through the night. According to parents' observation, reduced hours of sleep seem to increase risk for injury. There is an increase in falls and clumsy behavior when David's sleep routine is changed. For example, during vacations and holidays the family's daily schedule varies, as do sleep schedules. During these periods of time, David often sleeps fewer hours than usual and parents observe an increase in clumsy behavior and falls.

Seating

David's seating habits were observed while using ergonomically appropriate chair and table. Height and positioning of furniture were appropriate for the child's height and suitable tabletop

activity. Given a choice of seating options (stool, chair with back, chair with back and arm rests, etc.), David expressed clear preference for the type of chair used in his preschool and to which he had become accustomed. It was a simple wooden chair with back support and no arm rests. David required a subtle reminder to position his chair close to the table. If not reminded, he tended to sit at a slight distance, or at an angle, from the table. This increased his risk of falling from a chair. Once David properly positioned himself on the chair directly facing the table, he maintained a stable body position with functional and safe seating while engaging in hand held games and other table top activities. While this is true for participation in activities which required static seating, David tended to fall during transfers to and from his chair, from standing to sitting and from sitting to standing. In addition, falls were observed when David shifted his body direction while remaining seated. For example, he became unstable and at risk for falls from a chair when distracted by stimuli not directly in front of him (such as a bird flying past the window on his right side or a sudden knock on the door on his left side). Another frequent example occurred when he turned to face a person speaking to him. Shifting in his chair in order to sharpen a pencil over the trash bin positioned on the floor to the side of

his chair also caused him to fall.

Fine Motor Skills and Hand Dominance

David displayed age appropriate developmental abilities of in-hand manipulations and fine motor grasps, including skills of motor speed and dexterity, in both hands. David tended to tire quickly because of weakness. He had difficulty applying sufficient pressure on pencils during drawing and applying sufficient force on pieces of hand-held construction games. He successfully crossed midline in a range of fine motor construction table top activities and during drawing tasks on paper. At this time, David did not show clear signs of hand dominance. He was able to perform tasks of bilateral coordination, although he manipulated objects in both his hands without signs of dominance preference. When presented with objects to be grasped at his midline, David did not demonstrate a clear preference for dominance: His reactions were inconsistent; He initiated movement with both hands together, with his right hand, or with his left hand. According to his parents, David alternated between hands during activities of play and function at home. David's parents completed a "writing readiness" checklist of observable motor behaviors (given to them by the

occupational therapist) to determine signs of preference for dominance. Twenty-three items were marked on the checklist. Of these, David performed four items with both hands, 10 items with his right hand, and nine items with his left hand. These results were inconclusive. Towards the end of the 10 week treatment session, the occupational therapist observed a slight preference for initiating motor activities with the right hand during performance of tasks that require increased force, during free play. This observation may indicate a preference for right handed dominance. Further observation is required.

Gross Motor Play

David attained age appropriate developmental gross motor milestones. However, he continued to experience accidental falls, especially during gross motor play and other gross motor movement activities. The occupational therapist observed him falling during free play while running across a room, walking along a low balance beam, and climbing a ladder attached to wall. When David maintained a stable body position (either static sitting or static standing positions), he succeeded at gross motor tasks of precision such as catching a ball, throwing a bean bag to target, clapping his hands, hitting a balloon with a stick, etc. In these cases, he stood with feet

in a wide stance which provided him with more stability than standing with feet together. He displayed difficulty performing these same tasks when his body was in motion (not in a stable static sitting/standing position). When a ball was thrown in his general direction (but not directly at him), it was very difficult for him to shift his body in the direction of the ball, take steps towards the approaching ball, and then catch the ball. This was likely to result in a fall.

Emotional Reactions

David generally cried and looked to his mother for comfort and reassurance when he fell. His mother consistently responded outwardly in a calm and loving manner. She confided to the occupational therapist that she inwardly felt helplessness and distress due to the continuing risk of falls. On occasion, David paused after falling, calmed himself, and resumed the task at hand, without intervention from an adult. The therapist addressed the emotional stress and fear observed in both the child's and mother's reactions. The therapist informed the mother that emotional counselling is available for both the child and parents through the public health fund, should they choose to access this service.

Participation

David presented as a sweet, happy, and curious child. He understood oral instructions and communicated clearly. He participated well in the treatment sessions. He showed initiative, maintained attention, and expressed enjoyment and satisfaction. He had a warm relationship with his mother and he showed enthusiasm to share experiences and accomplishments with her. His mother was supportive and encouraging of his participation. A pleasant and trusting relationship was established with the therapist. David displayed reluctance or refusal to participate in motor activities in which he experienced frustration or perceived failure. This reluctance hampered use of formalized testing and assessment tools within the treatment sessions, whose results would have otherwise been beneficial during the treatment process as objective measures of performance ability. The initial evaluation report did not include details of assessment tools used. The treating therapist would have liked to perform standardized tests, but the child was reluctant to participate. As such, therapist evaluations were primarily based on qualitative observation of the child and on parent interviews.

In collaboration with David and his mother, the therapist identified short term

and long term treatment goals. These goals included continued analytical observation of David's motor habits by the therapist, as per the recommendations of the evaluation report.

Long term Goals:

1. SEATING: David and his parents will receive recommendations and strategies for fall prevention, for home and school, based on his individual needs.

2. FINE MOTOR PLAY: David will continue to participate in table top fine motor activities (including games, drawing, and arts and crafts activities), while maintaining safe seating habits, implementing strategies for successful fine motor planning.

3. GROSS MOTOR PLAY: David will continue to participate in a variety of age appropriate gross motor play activities, while implementing strategies for successful motor planning and fall prevention.

Short term Goals:

1. SEATING: David will maintain safe and upright seated body position on a chair (similar to the regular children's chairs used in his kindergarten class), while engaging in table top play activities for 10 minutes.

2. FINE MOTOR PLAY: David will participate in a variety of age appropriate play activities. This includes: David will build simple structures of interconnecting construction blocks, using both hands; David will draw an image of a child while grasping the pencil in his dominant hand and stabilizing the paper in his non-dominant hand; David will cut simple shapes while properly gripping scissors in his dominant hand and holding the paper in his non-dominant hand.

3. GROSS MOTOR PLAY: David will participate in age appropriate movement activities for five consecutive minutes without incidence of falls. This includes: David will jump 10 times in sequence with both feet; David will throw a ball to target at a distance of two meters; David will climb five rungs on an upright ladder attached to a wall.

Intervention Outcomes

The therapist provided David with a range of opportunities and choices of age-appropriate gross and fine motor games, table-top play activities, drawing, and crafts projects. The following is a descriptive summary of the therapist's implementation of the above treatment goals:

Occupational therapy treatment was focused on developing awareness

and strategies to prevent falls, and on providing the child with opportunity to continue practicing and strengthening functional motor abilities in a safe environment.

David and his mother received instruction on ergonomic concepts and positioning principles which contributed to safe and stable seating. These were implemented in the treatment room, as well as at home during mealtimes and during participation in table top play activities. They also received further recommendations for fall prevention at home. Suggestions included: proper lighting; clear open play space without toys, electrical cords, movable carpets/mats, or other objects on floor which may be tripped over; safety bars on bathroom wall for support while bathing, non-slip mat in bathtub, and rug on floor to absorb water. The importance of consistent sleep habits was emphasized, as lack of sleep was observed by the parents to be a contributing factor in falls. Cognitive strategies for fall prevention (during both fine motor and gross motor activities) focused on the importance of the child's understanding of verbal instructions in order to best perform motor tasks. Additionally awareness of body position and stability, maintaining visual contact with the objects and tools being used, ensuring a safe physical environment, and continuous self-checking were reinforced.

David participated in a variety of motor play activities, including fine motor games, drawing and craft activities. These activities were graded to match the child's level of ability. They were designed to strengthen existing functional motor skills and also to promote development of new skills. These activities included tasks of bilateral coordination, fine motor ability, and crossing midline movements. David also engaged in asymmetrical bilateral motor tasks. This encouraged manipulation of an object in a preferred hand, while the opposite hand provided stability. Examples include: cutting with scissors; peeling stickers off of page and sticking them onto an object, drawing a person, copying shapes and coloring, building with blocks and other construction games, doing puzzles, using playdough with cutter shapes and molds, etc. David's mother encouraged him to continue practicing motor play activities at home in between treatment sessions in accordance with the therapist's suggestions.

David showed improvement in fine motor skills when using toy construction pieces, drawing materials and craft materials. He demonstrated an increase in applying fine motor strength, as well as dexterity and endurance. As his level of ability increased, David expressed less frustration and avoidance. He began to express more satisfaction

and enjoyment in fine motor games and activities. Towards the end of the 10 therapy sessions the therapist observed a slight preference for initiating fine motor tasks (which required increased force and applied pressure) with his right hand, during free play. However, David still did not show clear signs of hand dominance. In general, he continued to grasp items and manipulate them in both hands or he alternated between hands. Development of hand dominance requires further evaluation and intervention.

At the end of the treatment sessions, the therapist recommended: 1) An additional series of 12 occupational therapy treatment sessions (with goals relating to continued fall prevention at home and at school, and developing hand dominance in the context of pencil grip, pre-writing and other pre-school skills and requirements); 2) Follow up vision test and hearing test (for fall prevention); 3) Referral for counselling/emotional support for repeated trauma of falls and injury; 4) Participation in a therapeutic gross motor group offered by the public health fund.

The Author's Personal Experience as an Occupational Therapist

As the therapist, the author was especially inspired by David's mother,

who accompanied him to therapy sessions. The mother modeled calm and hopeful behavior for her child during these sessions. She consistently relayed the message to her son that she had confidence in him. She encouraged him to persevere. From the time of prenatal diagnosis until the present, she and her husband were faced with many medical, developmental and emotional challenges relating to their child's health. They responded to these challenges with optimism. In discussions with me, she explained that their faith includes the belief that when an individual is presented with a challenge in life, included are the potential and the tools to deal with that challenge. They believed strongly in the positive power of prayer and blessings. The author's impression is that the parents' attitude is significant to David's perceived emotional ability to cope with repeated falls and motor difficulties. This experience reinforced the author's understanding that respect and acknowledgement must be given to the role of parents in occupational therapy intervention with children.

Rhombencephalosynapsis is a very rare condition with possible severe limitations on health and development. Given the diagnosis which includes dysgenesis of the corpus callosum and hypoplasia of the cerebellar vermis, the author was encouraged by David's

high level of functioning, his sweet personality and his age appropriate language and cognitive skills.

Discussion

Practical implementation of occupational therapy treatment in this case was based on the theoretical constructs of play discussed above. Play is established as a meaningful and purposeful occupation (American Occupational Therapy Association, 2014) which is an essential component of child development (World Health Organization, 2007). Research shows that play is primarily used by therapists as a treatment tool to encourage improvement in other areas, such as motor skills. According to repeated surveys of pediatric occupational therapists working with preschool-age clients, few therapists set goals for play as play is not sufficiently considered an outcome of importance (Kuhaneck, Tanta, Coombs, & Pannone, 2013).

Play must continue to be promoted as an important occupation of childhood.

Neuroplasticity is a guiding concept in encouraging motor development and in improving motor ability in cases of congenital brain structure anomaly (Tovar-Moll et al., 2007). Occupational therapy sessions provided David with opportunities for strengthening existing

skills and for learning new motor skills. A comparative study was performed on somatosensory functions in children with partial and complete agenesis of the corpus callosum. In comparison to a control group, findings indicate somatosensory problems and slower reaction times, however functional consequences are unclear as these deficits do not appear to have a negative effect on day-to-day behaviors (Friefeld, MacGregor, Chuang, & Saint-Cyr, 2000). Further study and research is needed to better understand neuro-motor development and its effect on functional ability in cases of structural neurological anomalies.

There are additional outcomes of this case study which have implications for future occupational therapy treatment.

Most importantly, physical safety must be a priority in children's participation in play. In this case, occupational therapy intervention focused on fall prevention and on reinforcement of safe motor routines during participation in table top games, drawing activities, craft activities and in gross motor play. Treatment included attention to seating habits and ergonomics, cognitive strategies for maintaining stability and preventing falls and avoiding injury, and adaptations to the home physical environment. A study on parental safety concerns found that in cases of perceived risk and fear

of injury, children were discouraged from participating in certain sports and physical activities. It is recommended that guidelines and modifications be implemented in order to encourage participation in physical play, to minimize risk of injury and to address parental concerns (Boufous, Finch, & Bauman, 2004). This confirms the importance of proactively setting up safe conditions for play; and validates the parents' role and concerns in their children's well-being.

Recurring and frequent falls may be traumatic to the child and to the parents, as observed by the therapist in David's case. At different times throughout the course of treatment, David expressed a variety of feelings relating to his accidental falls (including: fear of injury, hesitancy to engage in physical activity, frustration, disappointment, need for comfort, need for reassurance, and more). Healthy emotional mental functions involve the regulation and expression of a range of emotions. These factors, along with others, affect performance skills and participation in occupations (American Occupational Therapy Association, 2014). As such, emotional support should be offered to cope with the experiences of previous falls and to address fear of falling in the future.

Parental involvement is integral to a child's successful therapy treatment

(Baker et al., 2012). In this case study, the parents provided significant support and encouragement to the child. They were instrumental in implementing recommendations for the home. Furthermore, it is found that occupational therapy benefits the parents and specifically meets their needs, in addition to the needs of the child. The availability and sensitivity of the therapist are viewed by mothers to be important professional strengths (Ricon, Altaras, & Sachs, 2017).

Pediatric intervention is focused on the child, but must also be geared towards the parent and should include emotional support and education, as needed.

Finally, it is important for therapists to acknowledge the role of spirituality, faith, and religion as these concepts are perceived by the client and their family. Spirituality, along with values and beliefs, impact the individual's motivation to engage in occupations (such as play), as well as provide meaning in life. Spirituality offers opportunities for the individual to experience meaning, purpose, and connectedness (American Occupational Therapy Association, 2014). The role of spirituality is gaining increasing attention in health care settings. A relationship exists between spirit, occupation and health.

Conceptual and practical approaches have been developed to be integrated into occupational therapy intervention in a culturally-sensitive, inclusive and welcoming manner (McColl, 2011).

In David's case, faith provides comfort, hope and confidence to his parents. They relay those values to their son, and this positively influences treatment participation and outcomes. The parents' involvement is integral to the child's occupational therapy intervention. Their faith and belief system had a positive impact on their own hopeful attitudes and on the child's progress. As such, it is relevant to address the role of faith in occupational therapy intervention.

Conclusion

Play is an integral component in child development. It includes meaningful activities and contributes to quality of life. In this case of congenital brain structure anomaly, neuroplasticity provide a theoretical rationale for intervention to strengthen existing motor skills and to learn new motor skills in play. More research is recommended on the practical application of the theoretical understanding of neuroplasticity. Based on this case study, there are several implications for future occupational therapy intervention. Physical safety must be addressed as a priority in children's

participation in play activities. Safety counselling can be provided in the form of fall prevention training to the parents, by raising the child's awareness, and by practicing implementation of cognitive strategies in the therapy room setting. Falls may be traumatic and emotional support services should be offered to the child and parents. Parental involvement is integral to success of child's treatment. Spirituality is an essential factor in the success of treatment as it plays a role in providing comfort, hope and confidence.

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