CASE REPORT

A Child’s Occupational Performance: Considerations of Sensory Processing and Family Context

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Sensory processing problems can be serious enough to affect a child’s performance in school and home environments but often go undetected or are misunderstood. Poor sensory processing can affect a child’s ability to successfully perform daily activities because of its effect on cognitive, sensory, and motor development. The relationship of sensory processing to children’s occupational performance in their daily lives is an important consideration.


Occupational performance in home and school environments encompasses a wide variety of activities. A global approach for evaluation and intervention is beneficial in promoting successful participation in age-appropriate developmental tasks. Viewing the client as a whole person related to family and context, rather than as separate entities such as fine motor or cognitive skills, is useful for promoting function and independence (Stewart & Harvey, 1990). The occupational performance model provides a framework for intervention that addresses different concerns affecting participation in daily activities. This model focuses on what the client or family members perceive to be the important issues causing difficulties in daily activities. The occupational performance approach considers the person (performance skills), the environment (nonhuman and human contexts), and the occupation (meaningful activity), which relate together to support the person’s specific tasks and roles (Baum & Law, 1997). For example, a child’s ability to complete a puzzle is affected by environmental influences, such as parent or teacher support; performance skills, such as fine motor and cognitive abilities; and desire to complete the task. Problems are identified in terms of dysfunction in occupational performance, not just difficulties in performance components. Literature on the application of an occupational performance model to pediatric intervention is limited (Stewart & Harvey, 1990); however, viewing children from this approach appears to be a meaningful way for occupational therapists to examine current challenges in pediatric practice.

This case study describes a 3-year-old girl named Sara who exhibited difficulty in her occupational performance related to home and preschool contexts. The occupational therapy intervention focused on addressing parental concerns, enhancing performance skills, and optimizing environmental supports. These areas were the main considerations from an occupational performance perspective. Sara’s family (human environment), her home and school (nonhuman environments), and her performance skills were all interrelated.

Case Study

Sara was initially referred for an occupational therapy evaluation because of behavioral problems she exhibited in the classroom. The teacher reported that Sara had frequent tantrums and was unable to maintain attention to tabletop tasks. She threw toys at other children and frequently ran around the room when the teacher asked her to stay in her chair. Sara’s mother reported that Sara exhibited daring behaviors in the home setting, including jumping from high counters and purposely running into walls. The speech–language pathologist treating Sara for expressive speech delays in the school setting recommended occupational
therapy to enhance Sara's ability to tolerate the school environment. Sara's parents agreed and requested a referral from their pediatrician.

**History**

Sara was born in the Middle East and migrated to the United States with her family as a toddler. She achieved developmental milestones of sitting, walking, and expressing initial words at expected times. The mother reported that Sara was always an active child and that she did not suspect that Sara's behavior was unusual until Sara entered a preschool program. Sara's brother was 1 year of age at the time of evaluation. Her interactions with him were minimal, but her mother believed that she needed to protect him from Sara's boisterous behavior. This information about family life gave the evaluating occupational therapist an idea of the human environmental aspects affecting Sara's occupational performance at home.

Sara had attended preschool for approximately 6 months before the referral to occupational therapy. Her mother reported that the teacher had expressed concerns from the first month. These concerns increased to an overall concern for the other children's safety when Sara was having more frequent tantrums and banging her head. In addition, both the teacher and the mother were concerned about Sara's inability to manage her behavior sufficiently to participate in typical preschool classroom activities. Sara's mother clearly indicated a desire to enhance her child's abilities to "do better" in school. Overall occupational performance concerns included difficulty with peer and sibling interaction, need for evaluation of environmental supports in the home and school settings, inability to engage optimally in the primary occupation of play in a preschool or home setting, and maladaptive behaviors interfering with performance.

**Evaluation of Occupational Performance**

Sara was evaluated in two 1-hr sessions in a quiet room of the university outpatient clinic. Her mother, father, and brother were present for portions of the evaluation. Sara initiated environmental exploration easily on her initial visit. She maintained only brief interest in a variety of activities, with more sustained attention to objects that involved movement (e.g., a swing). She smiled frequently and intermittently engaged in verbal expression. With structured activity, such as a puzzle, Sara had difficulty staying on task, even with frequent verbal cuing. By the end of the 1-hr session, Sara was unable to focus, and she moved randomly and quickly from one object to another.

Sara exhibited low muscle tone throughout her body. The evaluating therapist could feel only minimal resistance when Sara's arms were moved quickly. Sara also displayed poor postural control evidenced by compensatory efforts to stabilize her postures (e.g., keeping her arms close to her sides). She was unable to maintain some antigravity postures in prone and supine.

During functional tool use, Sara used a gross grasp-and-release pattern but lacked refined pincer patterns and in-hand manipulation skills. She used a palmar supinate grasp on writing utensils and excessive grasp force, including tensing her entire right arm. Sara was able to remove simple clothing and assist with dressing. She was able to feed herself with a utensil as appropriate for her age. Her parents reported that Sara was "stubborn" and unable to do simple tasks in the home, such as sibling play, without getting frustrated.

**Assessments**

A sensory history (Cook, 1991), the DeGangi-Berk Test of Sensory Integration (Berk & DeGangi, 1987), and the Early Intervention Developmental Profile (Schafer & Moersch, 1981) were used for the evaluation. The sensory history is a parent-completed checklist describing several aspects of sensory system function. As such, it enables a parent to participate in the evaluation and provides needed information about the home environment. Possible responses include always, frequently, occasionally, seldom, and never. Sara's mother completed the checklist at home and returned it to the occupational therapist on the second evaluation visit. She checked always for the following statements: seeks out all kinds of movement activities; takes risks during play (e.g., jumps off tall furniture); and hangs on other people, furniture, or objects.

The DeGangi-Berk Test of Sensory Integration measures sensory integrative function in children 3 to 5 years of age. Sara achieved a score of 7 for postural control, 4 for bilateral motor integration, and 0 for reflex integration; all scores were in the deficient range. The 0 score reflected Sara's inability to sequence the steps of the testing task, which included assuming a quadruped position and turning her head to the left side and right side, then upward and downward. A combination of the three scores placed Sara's overall functioning level in the deficient range.

The Early Intervention Developmental Profile is a checklist of age-related skills in main categories of development, such as gross motor and cognition. Sara exhibited skills developmentally appropriate for her age range.

By the end of the two-session evaluation period, Sara had been dismissed from her preschool. The teacher stated that Sara was "unmanageable" and would not be able to return until her behaviors change.

**Intervention**

The evaluating occupational therapist recommended that Sara receive therapy twice weekly at a center of the parents' choice in order to promote sensory integrative functioning.
for improved occupational performance. Primary concerns were modulation difficulties in the form of an under-responsive vestibular system, poor postural control, and high arousal levels, which interfered with Sara's occupational performance at home and school. Because of the evaluating therapist's limited clinical time, other pediatric occupational therapists in the vicinity who could provide the necessary treatment were recommended. Sara's parents repeatedly expressed their desire to continue at the university clinic, which was close to the mother's workplace and was where familiarity and comfort had been established.

After home routines and family roles were discussed, the evaluating therapist and Sara's parents agreed that the therapist would provide therapy 1 hr per week in an outpatient setting and that there would be an active home program collaboratively planned by the therapist and the parents. The home program would include sensory activities that would be incorporated and adapted as Sara's mother felt comfortable adding them. The mother reiterated her strong desire to be involved in appropriate home activities.

**Clinic**
The clinic environment contained activities conducive to sensory integration intervention. It had several different types of swings, colorful balls of all sizes, a ball bath, drawing boards, and a variety of tactile bins and age-appropriate toys. Initially, Sara was allowed to explore the environment randomly and choose any activity she desired. As she became more comfortable with the occupational therapist and the environment, she was encouraged to engage in an activity for slightly longer periods (e.g., toy exploration). When she explored a sensory activity that provided her with age-appropriate sensory challenges, that activity was expanded to challenge her level of performance. For example, a slightly elevated bolster swing was used instead of a net swing to encourage increased proprioceptive input and antigravity postures when Sara hung upside-down and then climbed up into a sitting position. Gradually, such occupational tasks as putting together a simple puzzle or drawing a simple figure were introduced in the last part of each 1-hr session.

Three-month performance objectives for the weekly clinic sessions included the following:

- Engage in tabletop play activities for 10 min with minimal verbal cuing (e.g., puzzles, coloring)
- Exhibit self-initiated calming or organizing strategies two times during the session
- Engage in a structured gross motor play task within a designated space for 10 min (e.g., 3-5-part obstacle course)

**Home**
After observing the therapy sessions, the mother's awareness of Sara's sensory needs increased, and she became eager to initiate a home program. She described various sensory processing difficulties that she had observed in Sara at home. When discussing the type of involvement she was able to provide, while taking her other obligations into consideration, the mother agreed to take Sara to the park at least once daily for 1 hr, and she agreed to integrate other sensory activities into her daily caregiving routine. Several types of vestibular and proprioceptive activities that Sara appeared to need were available at the park: monkey bar climbing, slide play, and games incorporating running and jumping. Recommended proprioceptive tasks and vestibular play activities were deep touch, gentle pressure through shoulders, placing of heavy pillows over Sara's body, and gentle blanket swinging. Specific periods and frequencies for the home program activities were suggested, but the therapist encouraged the mother to observe Sara's response and determine whether more or less input was needed. This collaboration in treatment planning and execution would allow the mother to adapt activities and suggest changes on the basis of what she perceived to be Sara's needs. The mother's involvement increased throughout the 3-month intervention period as she became more interested and better able to understand which activities were effective with Sara.

Three-month performance objectives for the home setting included the following:

- Provide Sara with activities to help her organize her behavior (e.g., deep touch incorporated in playful games)
- Facilitate Sara's learning about how to help calm and organize herself (e.g., encouraging Sara to use words to describe how she is feeling and to state what makes her feel better)
- Promote age-appropriate involvement in functional and play tasks for successful participation in home and school activities (e.g., grading puzzles down to four pieces initially and gradually increasing size and complexity as Sara is able to successfully complete)

**Results**
The occupational therapy intervention was discontinued after 3 months because Sara's parents indicated that they would be moving out of state. Although further therapy was appropriate, Sara had made tremendous gains evidenced by an increase in scores on the DeGangi-Berk Test of Sensory Integration. Her retest score increased by 8 points (from 7 to 15) for postural control, by 17 points (from 4 to 21) for bilateral motor integration, and by 14 points (from 0 to 14) for reflex integration.

Specific improvements in Sara's behavior and occupational performance that had meaning for this particular family were an ability to quietly color and engage in other tabletop play for a 2-hr airplane trip, cessation of head banging, diminishment of tantrums, and sleeping through
the night. Additionally, the mother stated that she had gained an awareness of Sara's sensory needs and could independently initiate a variation in Sara's activities as her behaviors warranted. For example, as Sara became more organized in her behavior, her mother offered tabletop tasks that would take a little longer to complete. Before the tabletop tasks, she would promote active play that allowed Sara to run and jump. She stated that Sara “did a better job” when she was given movement opportunities before puzzle assembly or drawing. Sara achieved all of her 3-month goals during the intervention. The preschool staff was prepared to re-enroll Sara; however, Sara’s parents decided to keep her home and continue to enhance her preacademic and play skills before the family’s relocation.

Discussion and Recommendations

Sensory Considerations

Sensory integration refers to a neurological process as well as to a theory developed by Ayres (1972) relating this process to behaviors observed in children. Sensory integration intervention involves the use of graded sensory experiences in the context of child-directed and meaningful activity to elicit an adaptive response (Fisher & Murray, 1991).

Sensory integration dysfunction may limit a child’s ability to effectively process sensory information and produce an adaptive motor or behavioral response in a preschool or home environment. A vestibular—bilateral and sequencing disorder is one example of the type of sensory integration dysfunction a young child can experience. This disorder can be characterized by poor postural mechanisms, inadequate bilateral integration, and underresponsive vestibular systems. Test results and clinical observations of Sara’s difficulty with coordinating both sides of her body and her continuous movement in play indicated concerns in this area. It is believed that children with this type of disorder usually need more intense sensory input to perceive the same type of sensation as children without this disorder (Mailloux & Burke, 1997). These children are usually described as very active because they seek out a variety of movement activities. Difficulties with bilateral integration and sequencing can make typical preschool activities, such as cutting, folding, and construction, frustrating (Mailloux & Burke, 1997).

Dunn (1997) described a combination of neuroscience and behavioral concepts to explain sensory processing in relationship to children’s performance in daily activities. The central nervous system is responsible for modulating information by creating a balance between overactivity and underactivity. When young children have poor modulation, they can exhibit extremes, such as overly excitable behaviors. Although a broad range of behaviors can be observed in children with modulation difficulties, the main characteristic is an inability to regulate information to produce an appropriate response. In Sara’s case, there appeared to be modulation difficulties exhibited by continuous movement, a lack of caution in play, and a craving for vestibular input. According to Dunn, the most effective interventions for these types of children incorporate the desired and needed sensations into their daily life experiences. Knowledge of the use of self-directed activity for influencing arousal levels, an awareness of mechanisms involved in attention and modulation, and an understanding of neuroscience enable a pediatrics-trained occupational therapist to effectively address the needs of children with sensory processing problems.

Family Context

Family-centered care mandates have heightened occupational therapists’ awareness of incorporating the family into goal setting and treatment planning strategies (Lawlor & Mattingly, 1998). This is a departure from former intervention approaches where the occupational therapist attempted to enhance performance skills through the use of sensory-related activities for prescribed lengths of time in a clinic environment without the parent as an active participant in goal setting or treatment modification. In Sara’s case, the parents stated a preference for and chose to take an active role in planning and implementing appropriate sensory-based activities in the home setting. Consideration of family priorities is an integral part of human context in the occupational performance approach (Fearing, Law, & Clark, 1997).

Although this particular family effectively managed a home program, other families may find this overwhelming and time consuming. Family routines, roles, and values and meaningfulness of home program involvement should be considered when determining the appropriateness of a home program. A knowledge of family members’ occupations, not just the child’s, is important for planning optimal occupational therapy intervention.

Other factors besides family-centered care mandates have dictated a change in how pediatric occupational therapists provide intervention. Managed care protocols, limited allotment of visits, and lack of coverage for occupational therapy services are shaping both the type of treatment provided and the treatment frequency. Alternatives to traditional direct care include consultation models, intensive treatment periods with follow-up consultation, bimonthly or monthly developmental checkups, and video conferencing for families unable to travel to care centers. In Sara’s case, a treatment frequency initially thought to be less than optimal (e.g., once weekly instead of twice weekly) resulted in being effective for her progress with the addition of a home program and parent-therapist collaboration.

Another consideration for this particular case could have been the inclusion of a play assessment, play history, or both to capture the specific abilities and quality of interactions in Sara’s primary occupation because the occupa-
tional performance approach was incorporated. Her initial play skills were not appropriate for her age, and an observational tool would have enhanced outcome measurement of progress and change in this important occupational performance area. The incorporation of a more formal play assessment may have also enhanced the parents' awareness of the relationship between sensory processing and age-related occupational tasks, including play.

Conclusion

Pediatric occupational therapists can serve children and their families by including collaboration with family members, examining the meaningfulness of therapeutic activity in family life, and considering the environmental impact on performance. In Sara's case, her parents had indicated a strong desire to help her successfully participate in preschool activities. Their engagement in therapeutic program planning and implementation was fostered by collaboration with the occupational therapist. Both home and school environmental considerations had a major influence on goal setting and home program development. Building effective partnerships with families, valuing their desires for treatment strategies, and creating goals that mirror the aspects of parental concern can enhance the occupational performance of a child with sensory processing differences as evidenced in this case.

References


