Best Practices in Occupational Therapy for Enhancing the Lives of children with Neonatal Abstinence Syndrome: A Literature Review

Andrea M. Logwood

Shawnee State University PPOTD Program

OTD 8001

Dr. Stone

11-17-2024

Best Practices in Occupational Therapy for Enhancing the Lives of children with Neonatal Abstinence Syndrome: A Literature Review

Introduction

The opioid epidemic has increasingly plagued communities in the United States since 2000. The innocent victims of this epidemic are the children born with neonatal abstinence syndrome (NAS). The Centers for Disease Control and Prevention (2024) reports that the number of infants born with NAS increased by 82% from 2010 to 2017. In 2020, rates of NAS ranged from 9.9 per 1000 births in New Jersey to 88.1 per 1000 births in West Virginia (West et al, 2023). Importantly, intrauterine exposure in infants is linked with poor health outcomes such as poor fetal growth, preterm birth, still birth, specific birth defects, and neonatal abstinence syndrome. Early intervention is crucial to mitigate the effects of NAS on development (Yen & Davis, 2022). The purpose of this literature review is to explore the best intervention practices in treating children with NAS. Occupational therapy plays an important role in treating children with NAS by addressing their unique needs and supporting developmental outcomes (Oostlander et al, 2019).

Background Information

Neonatal abstinence syndrome is a condition that is characterized by a constellation of physiological and neurobehavioral signs of withdrawal that may occur in newborns who were exposed to psychotropic substances, primarily opioids, during pregnancy (West et al, 2023). Signs of withdrawal can include the following: “poor feeding and sucking, tremors or seizures, sleep problems or irritability, excessive or high-pitched crying, hyperactive reflexes, loose stools, dehydration, vomiting, increased sweating, yawning, stuffy nose, or sneezing” (Centers for Disease Control and Prevention, 2024). The signs and severity of symptoms vary and depend on various factors such as the last time the substance was used, the amount and type of substance, was the baby premature or full-term, and if the baby was exposed to alcohol, tobacco, or other medications before delivery. Neonatal opioid withdrawal syndrome (NOWS) is another term used to describe infant withdrawal from maternal opioid use (Yen & Davis, 2022). However, most clinicians use the term NAS due to polysubstance abuse. Infants born with NAS or NOWS have a higher risk of emergency room visits and rehospitalization, and long-term implications such as developmental delays, behavioral, educational, and psychological issues. Research indicates that at 18 months, children with NAS experienced neurobehavioral deficits and developmental delays (Yen & Davis, 2022).

Overview of Occupational Therapy

    In the fourth edition of the *Occupational Therapy Practice Framework: Domain and Process* (*OTPF-4*), occupational therapy is defined as “the therapeutic use of everyday life occupations with persons, groups, or populations for the purpose of enhancing or enabling participation” (American Occupational Therapy Association, 2020). The *OTPF-4* relates that the goal of occupational therapy is to promote independence in meaningful occupations. Pediatric occupational therapy plays a crucial role in helping children achieve developmental milestones and participate in daily activities. Specifically, when working with children with NAS, occupational therapists provide support for withdrawal symptoms, feeding challenges, address motor delays, assist with self-regulation skills, help manage sensory processing deficits, and educate parents and caregivers on creating a calm environment (Oostlander et al, 2019).

Best Occupational Therapy Practices in the NICU for NAS

Withdrawal symptoms present challenges in engaging in daily activities for children with NAS and occupational therapy services provided in the Neonatal Intensive Care Unit (NICU) help to lessen the impact of the opioid exposure on development (Oostlander et al, 2019). Craig and Smith (2020) reports that high-risk infants benefit from a family centered neuroprotective care model. Non-pharmacological care is the first line of treatment for withdrawal in infants with NOWS (Pahl et al, 2020). Non-pharmacological interventions include modifying environmental stimulation, feeding practices, and the support of the mother-infant dyad. Medications such as morphine, methadone, or buprenorphine are administered if symptoms worsen despite non-pharmacological intervention.

Occupational therapy management of NAS in the NICU addresses sensory processing, developmental milestones, feeding, behavioral support, positioning and handling, the mother-infant dyad, and parent education (Oostlander, 2019). Infants diagnosed with NAS experience increased sensory sensitivities with touch, lights, sounds, smells. Occupational therapists create a calm environment with limited stimulation in the NICU for infants with NAS who present with central nervous system hyperirritability. Infants with NAS exhibit decreased head circumference which can result in delayed motor development (Suarez et al, 2018). Bonding with a caregiver is the most important factor in increasing head circumference for infants with NAS. Addressing mother-infant dyads is paramount for developing a secure attachment for mom and baby which also helps decrease the severity of withdrawal symptoms (Pahl et al, 2020). Infants with NAS present with lower rates of breastfeeding than their peers and often require caloric support measures due to expending more calories during feedings from excessive crying or gastrointestinal issues such as diarrhea or vomiting. Breastfeeding is recommended for infants with NAS unless contraindicated because breastfeeding is shown to delay or decrease severity of withdrawal signs (Oostlander, 2019). Infants with NAS require additional support for oral feedings (Nagy et al, 2024). Occupational therapists support infants with NAS for oral feedings by demonstrating oral-motor techniques and positioning strategies (Oostlander, 2019). Parent education is provided to mothers by occupational therapists to help identify signs of overstimulation and demonstrate calming techniques. Lastly, occupational therapists teach appropriate positioning and handling techniques to reduce stress for infants experiencing withdrawal symptoms.

Best Occupational Therapy Practices for NAS in Early Intervention

Occupational therapy services in the early intervention (EI) setting are provided under Part C of the Individuals with Disabilities Education Act (IDEA) for infants and toddlers from birth to age three (Early Childhood Technical Assistance Center, 2024). Occupational therapy (OT) services for children in EI are provided under a family-centered model and are individualized based on the child’s needs. OT services for infants and toddlers with NAS aim to help children improve fine motor and adaptive skills, enhance play skills, improve self-regulation skills, provide feeding and nutrition support, improve sensory processing skills, and provide family education and support (Yen & Davis, 2022). Infants who are experiencing withdrawal symptoms have delays in occupational performance and engagement, and OT’s work with infants and their families on strategies to provide a calm environment and support their daily activities. Toddlers with NAS frequently exhibit developmental and behavioral delays at 18 months (Yen & Davis, 2022). OT interventions based on STAR and Ayers sensory integration (ASI) frames of reference can be impactful for children with sensory deficits to improve performance in activities of daily living incorporating rich sensory experiences into treatment (McQuiddy et al, 2024). Clancey (2020) reports that strategies used by occupational therapists can impact self-regulation and social emotional development of toddlers diagnosed with NAS. In fact, research indicates that DIR/Floortime (Developmental, Individual Differences, and Relationships) approaches improve interactions between the foster mothers and their children to promote self-regulation and improve social skills.

Occupational therapists in the early intervention setting demonstrate effectiveness in meeting the occupational and participation needs of children and their families by using outcome measures such as standardized assessments, satisfaction surveys, and anecdotal reports which all provide data about the meaningful impact of occupational therapy (OTPF-4, 2020).

Gaps in the Literature

Neonatal abstinence Syndrome continues to be prevalent in rural communities. While there is ample research on NAS and pharmacologic interventions and nursing care in the NICU, there is little research on occupational therapy interventions for children with NAS (Benninger et al, 2020). In addition, there is a scarcity of research focusing on the impact of early intervention for children with NAS. Findings indicate that there is research available on perinatal substance exposure (PSE) but there isn’t much evidence regarding long term effects or follow up care. Longitudinal studies are needed to determine the long-term impact of occupational therapy interventions for children with NAS and how OT can impact long-term functional outcomes (Joseph et al, 2020). More research is also warranted to determine if specific OT interventions yield better results for children with NAS. Children with PSE are at a higher risk for risky behavior later in life. Lastly, there is limited quality research on strategies to improve self-regulation in children with NAS.

Conclusion

In summary, children with NAS benefit from a comprehensive developmental care model to yield the best outcomes (Craig & Smith, 2020). Occupational therapy plays a critical role in improving outcomes for children with NAS, but there is limited research on the effectiveness of occupational therapy interventions for this population. More research is indicated to study the impact of occupational therapy with children with NAS, the benefits of specific interventions, and longitudinal studies are needed to determine the long-term effects of neonatal abstinence syndrome.

**References**

American Occupational Therapy Association. (2020). Occupational therapy practice

framework: Domain and process (4th ed.). *American Journal of Occupational Therapy*, *74*

(Supplement 2*).* Advance online publication. <https://doi.org/10.5014/ajot.2020.74S2001>

Benninger, K. L., Borghese, T., Kovalcik, J. B., Moore-Clingenpeel, M., Isler, C., Bonachea, E. M.,

Stark, A. R., Patrick, S. W., & Maitre, N. L. (2020). Prenatal exposures are associated with worse

neurodevelopmental outcomes in infants with neonatal opioid withdrawal syndrome. *Frontiers in Pediatrics*, *8*. <https://doi-org.proxy01.shawnee.edu/10.3389/fped.2020.00462>.

Centers for Disease Control and Prevention. (2024, May 15). Opioid use during pregnancy.

<https://www.cdc.gov/opioid-use-during-pregnancy/about/index.html>

Craig, J. W., Smith, C. R. (2020). Risk-adjusted/neuroprotective care services in the NICU: the elemental

role of the neonatal therapist (OT, PT, SLP). *Journal of Perinatology, 40*, 549-559.

<https://doi.org/10.1038/s41372-020-0597-1>

Early Childhood Technical Assistance Center. (2024, October 1). Part C of IDEA.

[https://ectacenter.org](https://ectacenter.org/partc.asp#:~:text=Part%20C%20of%20IDEA%20-)

McQuiddy, V. A., Ingram, M., Vines, M., Teeters, S., Ramstetter, A, & Strain-Riggs, S. R.

(2024). The long-term impact of an occupational therapy intervention for children with challenges in sensory processing and integration.  *American Journal of Occupational Therapy, 78(4),* 1-10.

Nagy, S., Dow, K., & Fucile, S. (2024). Oral feeding outcomes in infants born with neonatal abstinence

syndrome. *J Perinat Neonat Nurs, 38(3),* 250-255. https://doi.org/10.1097/JPN.0000000000000741

Oostlander, S. A., Falla, J. A., Dow, K., & Fucille, S. (2019). Occupational therapy management strategies

for infants with neonatal abstinence syndrome: Scoping Review. *Occupational Therapy in*

*Health Care, 33(2), 197-226*. <https://doi-org.proxy01.shawnee.edu/10.1080/07380577.2019.1594485>

Joseph, R., Brady, E., Hudson, M.E., & Moran, M. M. (2020). Perinatal substance exposure and long-

term outcomes in children: A literature review. *Pediatric Nursing, 46(4),* 163-173.

Pahl, A., Young, L., Buus-Frank, M.E., Marcessus, L., & Soll, R. (2020). Non-pharmacological care for

opioid withdrawal in newborns. *Cochrane Database of Systematic Reviews*.

<https://doi.org/10.1002/14651858.CD013217.pub2>

Suarez, M. A., Horton-Bierema, W., & Bodine, C. E. (2018). Challenges and resources available for

mothers in opiate recovery: A qualitative study. *The Open Journal of Occupational Therapy*,

*6(4).* <https://doi.org/10.15453/2168-6408.1483>

Yen, E., & Davis, J. M. (2022). The immediate and long-term effects of prenatal opioid exposure. *Front.*

*Pediatr*. 10:1039055. https://doi.org/10.3389/fped.2022.1039055

West, K. D., Ali, M. A., Blanco, M., Natzke, B., & Nguyen, L. (2023). Prenatal substance exposure and

neonatal abstinence syndrome: State estimates from the 2016-2020 transformed Medicaid

statistical information system. *Matern Child Health J, (Suppl 1),* 14-22.

https://doi.org/10.1007/s10995-023-03670-z