



## EXPLORING EFFECTIVENESS OF THE HEP APPROACH ON SENSORY-MOTOR FUNCTIONS OF PRETERM INFANTS

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### INTRODUCTION

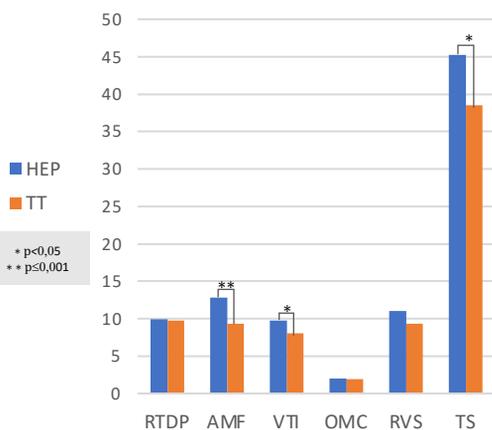
There has been increased interest in environmental enrichment (EE)-based interventions and their potential therapeutic benefits in neurodevelopment. EE is a paradigm that emerged from experimental studies on animals and has been described as manipulation of standard laboratory conditions that modify the quality and intensity of environmental stimulation. Essential features of EE are physiological homeostasis, safety, sensory experiences, spatial features of the environment, environmental and object novelty, challenge, enjoyment, continuity, social opportunities, active engagement in and exploration of the environment (Nithianantharajah and Hannan, 2006; Slater and Cao, 2016). Although Ayres Sensory Integration intervention shares many common features with EE (Reynolds et al., 2010) it can be more appropriately defined as “enriched therapy” (ET). ET involves therapist-controlled experiences for a specified period of time under certain conditions, whereas EE involves sensory/environmental adaptations that offer continuous opportunities in social, sensory, motor and cognitive areas through spontaneous exploration (Natali et al., 2020). The intervention principles of the Homeostasis-Enrichment-Plasticity (HEP) approach were developed from essential features of EE and these key features of EE are implemented with the guidance of core principles of ecological theories of development (Balikci, 2022). The aim of this study is to investigate effects of the HEP approach on sensory functions and motor development in premature infants with developmental risk.



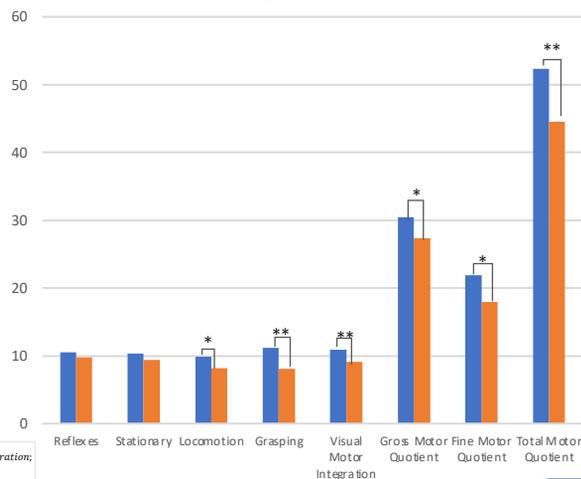
### METHODS

The study included 29 preterm infants who were born before 34 weeks of gestation and had corrected ages between 4 and 10 months. The infants were divided into two groups using stratified randomization: the HEP group (n=15) and the Traditional Treatment (TT) group (n=14). The HEP approach was applied according to the principles defined by Balikci (2022), and TT intervention was based on neurodevelopmental treatment principles. Both groups received intervention programs for 12 weeks, with one day of face-to-face and one day of online sessions per week. The infants' motor development [Peabody Developmental Motor Scales-2 (PDMS-2) was used], sensory functions [Test of Sensory Functions in Infants (TSFI) was used], and parental mental health [Beck Anxiety Inventory (BAI) was used] were assessed before and after the intervention.

Mean of TSFI Scores After Intervention



Mean of PDMS-2 Scores After Intervention



Mean Score of BAI After Intervention



### RESULTS

The mean corrected age of the HEP group was  $25.13 \pm 7.99$  weeks, and it was  $24.14 \pm 8.63$  weeks in the TT group at the baseline ( $p > 0.05$ ). The mean gestational age of the HEP group was  $28.93 \pm 2.81$  weeks, and it was  $29.79 \pm 3.53$  weeks in the TT group at the baseline ( $p > 0.05$ ). Before the intervention, there were no significant differences between the groups in terms of PDMS-2 standard scores, TSFI, and BAI scores ( $p > 0.05$ ). After the intervention, significant differences favoring the HEP group were found in locomotion, grasping, and visual-motor integration subscales on PDMS-2 standard scores ( $p < 0.05$ ), while no significant differences were found in reflexes and balance subscales ( $p > 0.05$ ). Additionally, the HEP group showed statistically significant improvement in fine motor, gross motor, and total motor quotient scores of PDMS-2 ( $p < 0.05$ ).

In terms of TSFI, statistically significant differences favoring the HEP group were found in adaptive motor functions, visual-tactile integration subscale scores, and total score ( $p < 0.05$ ), while no significant differences were found in response to tactile deep pressure, vestibular reactivity, and ocular-motor control subscale ( $p > 0.05$ ) scores.

There were no significant differences between the groups in terms of BAI ( $p > 0.05$ ), but a decrease in scores was observed in the HEP group, while no changes were observed in the TT group.

### CONCLUSION

In conclusion, HEP intervention based on ecological theories of development and environmental enrichment was found to be more effective than TT for improving motor development and sensory functions of preterm infants aged between 4 and 10 months, and it had positive effects on parental mental health.

### REFERENCES

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