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Is Upright Exploratory Play Influenced by Partial Body Weight Support in Infants with Down Syndrome?

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INTRODUCTION

Background: Children with Down syndrome (DS) typically present with delayed gross motor skills, which may negatively impact their development in other realms, such as cognition and language. The partial body-weight supported system (PBWSS) is a possible early intervention for infants with DS in physical therapy settings and in the community to facilitate motor development through exploratory play.

Purpose: To explore the effects of a PBWSS on upright play positions during exploratory play among infants with DS. Upright play positions include kneeling, squatting, standing, cruising, supported stepping, and walking.

Hypothesis: Infants with DS will demonstrate increased time spent in upright play positions after training in a PBWSS for nine 30-minute sessions.

METHODS

Subjects: Three infants were analyzed in this study.

Criteria to Participate: Children under the age of three, diagnosis of Down syndrome, able to sit independently but not pull to stand, and at least one parent can read and speak English

Procedure: Researchers used a 9x9ft play environment that included the PBWSS and toys. Infants under the age of three attended nine one-hour sessions over the course of three weeks. Infants moved freely within the space and interacted with researchers and present family members. Researchers behavior-coded the first 30 minutes of play for the first and last session with the PBWSS for each infant. Gross motor behaviors were coded for specific motions during the first two seconds of every six second interval for the duration of the 30 minute play time, totaling to 300 observations.

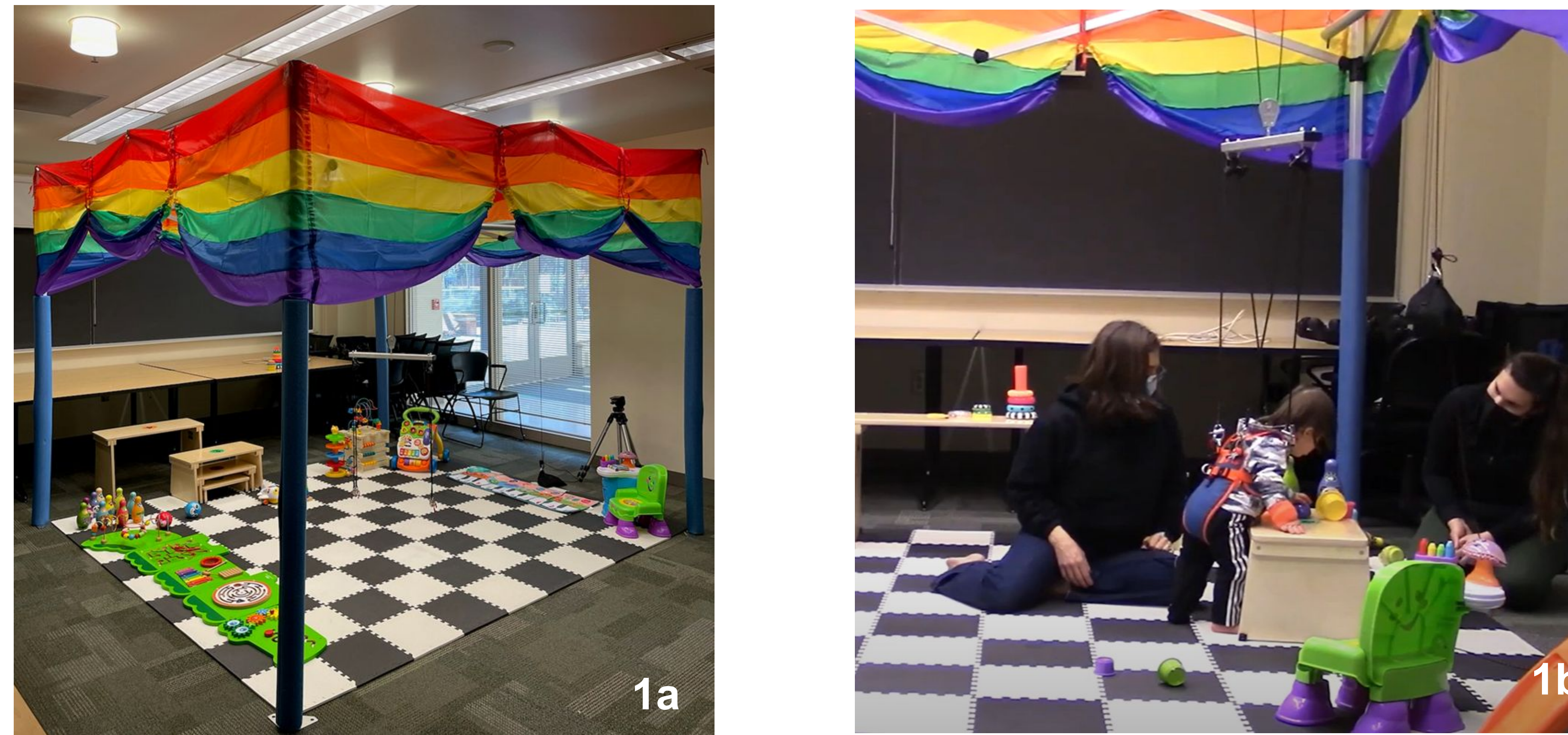


Figure 1a. 9x9 play environment with Portable Mobility Aid (PUMA) System.
1b. Child in PBWSS while playing in the environment.

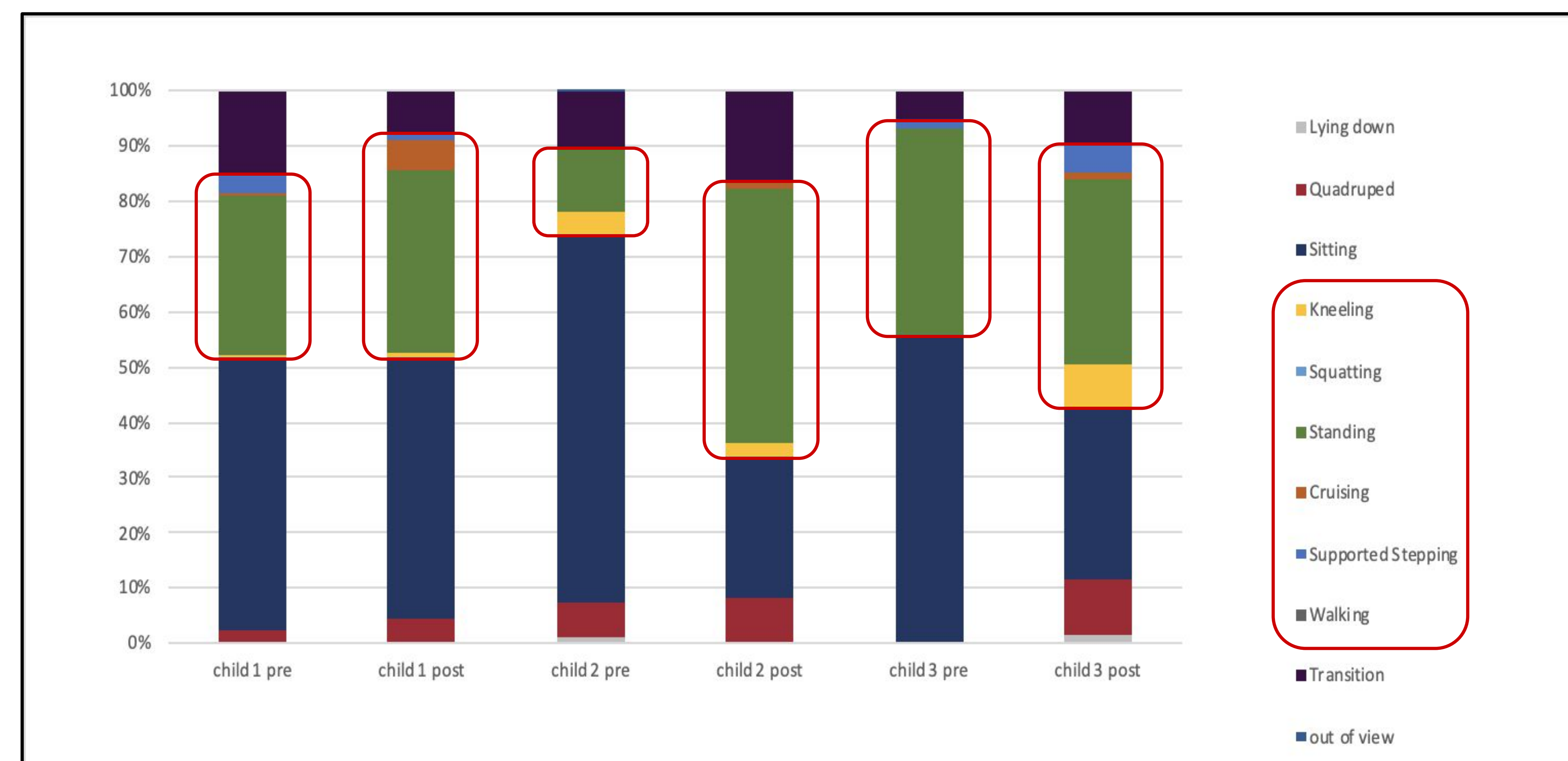


Figure 2. Time spent in different play positions for three infants pre- and post-PBWSS training. Red boxes indicate upright play positions.

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RESULTS

Observations of upright play increased in the last session compared to the first for all three infants:

- Infant 1: Time in upright play positions increased from 33% to 40.67%, with a total change of 7.67%
- Infant 2: Time in upright play positions increased from 15.67% to 49.67%, with a total change of 34%
- Infant 3: Time in upright play positions increased from 39.33% to 47.67%, with a total change of 8.34%

DISCUSSION

- The results from this study support our hypothesis; the harness led to an increase in upright play positions and behaviors
- Of the upright play position changes observed, the largest increase following training in PBWSS was standing for infant 1 and 2, and kneeling for infant 3
- Future studies with a larger sample size and control group are required to determine if this intervention would be a good addition to clinical practice

CONCLUSION

The PBWSS seemed to influence upright play positions during exploratory play for these infants with DS. The results of this study suggest that the PBWSS should be further explored as a possible early intervention for infants with DS. Future studies investigating the impact of the PBWSS on other realms of developmental delays in infants with DS, such as social behaviors, could also be beneficial.

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