

University of Dayton

eCommons

---

University of Dayton Doctor of Physical Therapy  
Annual Research Symposium

Department of Physical Therapy

---

5-2024

## Bal-A-Vis-X intervention to improve upper limb coordination in children with disability: A Pilot Study

Marta Boot  
*University of Dayton*

Zoe Clark  
*University of Dayton*

Kyla Hill  
*University of Dayton*

McKenzie Stefanoff  
*University of Dayton*

Betsy Donahoe Fillmore  
*University of Dayton*

*See next page for additional authors*

Follow this and additional works at: [https://ecommons.udayton.edu/dpt\\_symposium](https://ecommons.udayton.edu/dpt_symposium)



Part of the [Pediatrics Commons](#), and the [Physical Therapy Commons](#)

---

### Recommended Citation

Boot, Marta; Clark, Zoe; Hill, Kyla; Stefanoff, McKenzie; Donahoe Fillmore, Betsy; Renner, Trisha; Slutz, Bo; and Fisher, Mary I., "Bal-A-Vis-X intervention to improve upper limb coordination in children with disability: A Pilot Study" (2024). *University of Dayton Doctor of Physical Therapy Annual Research Symposium*. 50. [https://ecommons.udayton.edu/dpt\\_symposium/50](https://ecommons.udayton.edu/dpt_symposium/50)

This Book is brought to you for free and open access by the Department of Physical Therapy at eCommons. It has been accepted for inclusion in University of Dayton Doctor of Physical Therapy Annual Research Symposium by an authorized administrator of eCommons. For more information, please contact [mschlengen1@udayton.edu](mailto:mschlengen1@udayton.edu), [ecommons@udayton.edu](mailto:ecommons@udayton.edu).

---

**Authors**

Marta Boot, Zoe Clark, Kyla Hill, McKenzie Stefanoff, Betsy Donahoe Fillmore, Trisha Renner, Bo Slutz, and Mary I. Fisher

**Title:** Bal-A-Vis-X intervention to improve upper limb coordination in children with disability: A Pilot Study

**Student Researchers:** Marta Boot, Zoe Clark, Kyla Hill, McKenzie Stefanoff

**Faculty Advisors:** Betsy Donahoe-Fillmore, PT, PhD; Trisha A. Renner, PT, DPT; Bo Slutz, PT, DPT, Mary I. Fisher, PT, MSPT, PhD

**References:**

Polonus P. Utilizing Bal-A-Vis-X Exercises as an Adjunct to Physical Therapy Treatment of a Child with Autism and ADHD: A Case Report and Literature Review. *IOWA Research Online*. Published online 2018.

Sinaga ES, Syari M. The effect of Brain Gym on improving fine Motoric and gross motoric skills in pre-school children. *International Journal of Public Health Excellence (IJPHE)*. 2022;2(1):318-323. doi:10.55299/ijphe.v2i1.241

Vazou S, Klesel B, Lakes KD, Smiley A. Rhythmic physical activity intervention: Exploring feasibility and effectiveness in improving motor and executive function skills in children. *Frontiers in Psychology*. 2020;11. doi:10.3389/fpsyg.2020.556249

Watson-Grace A, Provident I. Improving selective attention for all students with coordinative bal-A-VIS-X movement breaks: A pilot study. *Journal of Occupational Therapy, Schools, & Early Intervention*. 2020;13(4):420-442. doi:10.1080/19411243.2020.1769000

Went J. Effects of Bal-A-Vis-X on Student Focus and Performance 2017. Academic paper. Accessed September 20, 2022. <https://www.bal-a-vis-x.com/resources>.

**Purpose/Hypothesis:** Balance/Auditory/Vision exercises (Bal-A-Vis-X) consists of a series of exercises using sand-filled bags and racquet balls. Most of the exercises are completed while standing on a rocker board and heavily rooted in rhythm. The rhythmic patterns are utilized to facilitate focused concentration, crossing midline, motor planning, right/left awareness, eye-hand coordination, balance, bilateral coordination, body and spatial awareness. Only a few published studies have explored Bal-A-Vis-X as an intervention in therapy. The purpose of this study was to investigate the use of Bal-A-Vis-X to improve upper limb coordination in children with motor delays.

**Number of Subjects:** Fifteen children with motor delays enrolled, ages 4 to 16 years (mean 9.73 years), have completed to date. Diagnoses included Down syndrome, autism, developmental delay, cerebral palsy, idiopathic toe walking, attention-deficit/hyperactivity disorder, and congenital myopathy.

**Methods and Materials:** Participants were assigned to a control or intervention group. All participants received physical therapy for 60 minutes once a week for 12 sessions. Each session for the intervention group (n=9) included Bal-A-Vis-X training for 20 minutes. Children in the control group (n=6) received intervention for the same length of time without Bal-A-Vis X. The upper limb coordination subtest of the Bruininks-Oseretsky Test of Motor Proficiency, 2<sup>nd</sup> edition (BOT-2) was administered prior to and at the conclusion of 12 sessions. Descriptive statistics were calculated. Change within the Bal-A-Vis X intervention and control groups was analyzed with the Wilcoxon Signed Rank test. Change between the groups was analyzed with the Mann Whitney U test. An a priori power analysis was utilized to establish significance at  $\alpha \leq 0.05$ .

**Results:** Data analysis found a significant difference ( $p=.007$ ) in pre- and post- BOT-2 upper limb coordination point scores within the intervention group. No significant difference ( $p=0.595$ ) was found in pre- and post- BOT-2 upper limb coordination point scores within the control group. A significant change score ( $p=0.026$ ) was found for the BOT-2 point scores between the control and intervention groups pre- and post-physical therapy intervention.

**Conclusions:** The participants in this study showed improvements in upper limb coordination after 12 sessions of physical therapy intervention that included a consistent dose of Bal-A-Vis-X training. The small sample size limits generalizing this finding to a specific patient population. Additional studies are needed within specific patient populations and to determine Bal-A-Vis-X dosing parameters.

**Clinical Relevance:** Bal-A-Vis-X training has potential as an intervention for therapists to improve upper extremity coordination in children.