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## Application of the Kinesio® Taping Method for a Child with Hypotonia: A Pilot Case Study

Margaret M. Griffin  
*Creighton University*, MargaretGriffin@creighton.edu

Christina Ann A. McGuff  
*Creighton University*, ChristinaFlucke@creighton.edu

Nicole C. Willse  
*Creighton University*, nicolewillse@creighton.edu

MacKenzie D. Twaddell  
*Creighton University*, MacKenzieTwaddell@creighton.edu

Julia Shin  
*Creighton University*, juliashin@creighton.edu

Author(s) ORCID Identifier:

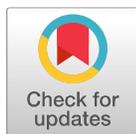
Julia Shin:  <https://orcid.org/0000-0002-3035-9714>

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## Application of the Kinesio<sup>®</sup> Taping Method for a Child with Hypotonia: A Pilot Case Study

Margaret M. Griffin, Christina Ann A. McGuff, Nicole C. Willse,  
MacKenzie D. Twaddell, & Julia Shin 

Creighton University

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### Abstract

**Background:** This study explored the application of the Kinesio<sup>®</sup> Taping (KT<sup>®</sup>) method in conjunction with traditional occupational therapy (OT) intervention for a child with hypotonia. Specifically, differences in functional hand outcomes (manual dexterity and grasp pattern) were examined between the sessions with and without the application of the KT<sup>®</sup> method.

**Methods:** A 9-year and 5-month-old male subject, at the time of enrollment, diagnosed with hypotonia, global developmental delay, and autism spectrum disorder participated in the study. A single-subject alternating treatment design was employed. A total of 14 OT sessions were conducted across baseline (n=3), alternating treatment (n=8), and replication (n=3) phases. During the alternating treatment phase, the subject was randomly applied the KT<sup>®</sup> method in four out of the eight OT sessions. At the end of each session, the participant was administered standardized assessments.

**Results:** There were no statistically significant differences observed in functional hand outcomes across the baseline, alternating treatment, and replication phases. There were no statistically significant differences observed in manual dexterity and grasp pattern between the sessions with and without the application of the KT<sup>®</sup> method.

**Discussion:** The results from the study replicated the mixed outcomes reported in the efficacy of the KT<sup>®</sup> method in addressing functional hand outcomes; OT practitioners are recommended to consider the KT<sup>®</sup> method as an auxiliary intervention modality. Future research involving the KT<sup>®</sup> method can consider ways to better control for the confounding variables noted in the current study including the novelty effect, subject's comorbid conditions, and number and length of sessions allotted across the baseline, alternating treatment, and replication phases.

**Keywords:** occupational therapy, hypotonia, hand strength, hand grip, Kinesio<sup>®</sup> Taping

## Introduction

The intrinsic and extrinsic muscles of the hand are imperative in supporting a person's ability to engage in a myriad of functional movements such as holding, grasping, and pinching. The dynamic hand positions and movements facilitate continuous interaction with parts of the environment and execution of meaningful, everyday activities (Arnet et al., 2013; Schreuders et al., 2007). They provide the functional capacity for individuals to participate in activities of daily living (ADLs) such as holding a toothbrush, buttoning a shirt, and grasping and manipulating scissors (Bae et al., 2015).

In occupational therapy (OT) practice, various therapeutic modalities and mechanisms are employed to promote functional hand movements with anticipated gains in participation, independence, and occupational identity (Kielhofner, 2014; Roll & Hardison, 2017). There are numerous medical conditions that can impact the functional capacity of the hand. Children with global hypotonia, for example, often experience limitations in grip strength, fine-motor precision, and utensil management using hands, interfering with their ability to successfully participate in the occupations of play, instrumental activities of daily living, and ADLs (Martin et al., 2005; ; Murrey & Woo, 2001; Naidoo, 2013; Simsek et al., 2011).

### *Hypotonia in Children*

Hypotonia is a complex condition involving the musculoskeletal system, central nervous system, and genetic dispositions (Martin et al., 2005; Naidoo, 2013). The literature highlights that early detection and treatment of hypotonia is recommended to reduce potential developmental complications and promote maximal participation in life (Strubhar et al., 2007; Tuysuz et al., 2014). Individuals who

present with hypotonia can exhibit symptoms including delayed motor development, excessive joint mobility, reduced resistance in the muscles, and difficulty maintaining optimal body alignment and posture (Naidoo, 2013; Paleg et al., 2018; Prasad & Prasad, 2011; Strubhar et al., 2007). Decreased activity tolerance and delayed motor skills are the two most frequently reported limitations for children with hypotonia (Martin et al., 2005; Naidoo, 2013). Common signs of hypotonia in the hand include decreased palmar arch and webspace, hyperactive deep tendon reflexes, and signs of primitive or clonus reflexes (; Paleg et al., 2018; Peredo & Hannibal, 2009). Hypotonia in the hand can also manifest in hyperlaxity at the joints, decreased strength, and weakened grip (Martin et al., 2005; Murrey & Woo, 2001; Peredo & Hannibal, 2009). Children with hypotonia may also exhibit decreased proprioceptive perception leading to hyperextension, hyperflexion, or deviation (Martin et al., 2005; Naidoo, 2013). To address hypotonia and joint laxity, traditional rehabilitation models primarily focus on range of motion and proprioceptive exercises, strengthening and endurance training, positioning techniques, and patient education (Engelbert et al., 2017; Ghibellini et al., 2015; Seu & Pasqualetto, 2012;). There is a growing body of evidence, however, supporting the use of the Kinesio<sup>®</sup> Taping (KT<sup>®</sup>) method as an adjunctive therapy to improve hand function in children in clinical contexts (Ibrahim, 2015; Rastii et al., 2017).

### *The Kinesio<sup>®</sup> Taping Method*

The existing literature highlights the recent advances in therapeutic taping approaches and techniques to address various musculoskeletal complications (Kaur et al., 2016; Morris et al., 2013; Mostsafavifar et al., 2012). Developed by Kase in 1973, the KT<sup>®</sup> method involves application of elastic, thin pieces of Kinesio<sup>®</sup> tape, which are externally fixated to

targeted parts of body to facilitate positive physiological outcomes in the musculo-skeletal, circulatory, and lymphatic systems (Kase et al., 2003). In clinical application, a certified practitioner in the KT<sup>®</sup> method can customize Kinesio<sup>®</sup> tape into various lengths and cut-out styles, placing these strips over identified muscles and joints for specific purposes; for instance, mechanical correction can restrict joint movements while lymphatic correction can be applied for edema reduction (Kase et al., 2003).

When applying functional correction technique, practitioners can purposefully intensify “sensory stimulation to either assist or limit a motion” with the tension created by the KT<sup>®</sup> method, increasing stimulation to the mechanoreceptors (Kase et al., 2003, p. 36). This increased stimulation to the mechanoreceptors is interpreted as proprioceptive stimuli by the body, promoting enhanced perception of joint and body positions (Halseth et al., 2004; Jaraczewska & Long, 2006; Kase et al., 2003). The Kinesio<sup>®</sup> tape can stretch 40-60% of its original length while applied, allowing individuals to have a full range of motion and freedom of movement without restrictions. The KT<sup>®</sup> method can be easily combined with traditional rehabilitative services such as physical therapy and OT (Kase et al., 2003; Kaur et al., 2016; Morris et al., 2013).

### ***The Kinesio<sup>®</sup> Taping Method in the Existing Literature***

With the increasing use of the KT<sup>®</sup> method in the field of rehabilitation, a growing body of literature highlights its benefits including reduction of pain, facilitation of blood and lymphatic circulation, optimal alignment of muscles and joints, and enhanced recruitment of movement patterns from enriched proprioceptive feedback (Kase et al., 2003; Rastii et al., 2017; Simsek et al., 2011). Several

studies illustrate that the KT<sup>®</sup> method was effective for individuals with stroke (Jaraczewska & Long, 2006; Kim et al., 2002), burn (Waked et al., 2017), and plantar fasciitis (Tsai et al., 2010) with positive outcomes gained in pain reduction, range of motion, and participation in activities of daily living. The KT<sup>®</sup> method was also found to be effective for improving range of motion, hand function, and self-care outcomes for pediatric populations with various neuromuscular conditions including cerebral palsy (Ibrahim, 2015; Keklicek et al., 2015; Rastii et al., 2017; Simsek et al., 2011), acquired brain and spinal cord injury (Yasukawa et al., 2006), and torticollis (Öhman, 2012). The use of the KT<sup>®</sup> method was recommended as an adjunctive tool in addition to traditional rehabilitative services including physical therapy and OT (Öhman, 2012; Yasukawa et al., 2006). In addition, there is an emerging evidence that the use of the KT<sup>®</sup> method can assist with compensating for reduced muscle tone when applied in conventional rehabilitation contexts (Jaraczewska & Long, 2006; Rastii et al., 2017). The underlying neurophysiological effects of the KT<sup>®</sup> method may positively contribute to traditional OT practice by promoting enhanced functional hand and upper extremity outcomes, which warrants further investigation (Hassan et al. 2020; Ibrahim, 2015; Keklicek et al., 2015; Yasukawa et al., 2006).

Despite the positive benefits proclaimed in the application of the KT<sup>®</sup> method, there are mixed empirical findings and recommendations endorsing its use in the field of rehabilitation (Morris et al., 2013; Mostsafavifar et al., 2012; Parreira et al., 2014; Williams et al., 2012). The systematic reviews on the effectiveness of the KT<sup>®</sup> method completed by Mostsafavifar et al. (2012) and Parreira et al. (2014) reported that the evidence for the KT<sup>®</sup> method to treat musculoskeletal conditions in clinical practice is inconclusive. Similarly, the

metanalysis completed by Williams et al. (2012) found low evidence to support the use of the KT<sup>®</sup> method to prevent and treat sports-related injuries over other taping techniques. Several other studies found that the KT<sup>®</sup> method did not yield significant functional outcomes in comparison to the control group with placebo/sham taping or no taping (Chang et al., 2010; Halseth et al., 2004; Thelen et al., 2008). Overall, the use of the KT<sup>®</sup> method remains controversial due to the mixed outcomes reported in the existing literature. There is a need for more research to evaluate the use of the KT<sup>®</sup> method as a complementary therapeutic modality in the field of rehabilitation.

### ***Problem Statement***

The effectiveness of the KT<sup>®</sup> method has been explored involving various populations, but there is limited quantity and quality of research supporting its use with the pediatric population. For instance, in the systematic review by Güçhan and Mutlu (2017) on the effectiveness of taping on children with cerebral palsy, only five out of nine studies included were randomized controlled trials; three studies indicated improvements in various motor outcomes post-taping while four studies did not indicate significant changes. The researchers concluded that due to high variability in intervention and outcome measures, “specifics of how and when to use taping to get the best effect remain unclear” (p. 30), discussing a need for more quality research with larger sample sizes and standardized procedures (Güçhan & Mutlu, 2017). Similarly, in the systematic review completed by Hassan et al. (2019) on the effectiveness of the KT<sup>®</sup> method for children with brachial plexus injury, of five studies included, no randomized controlled trials were identified. The researchers cautioned that further research

is warranted to draw clear decision about the effectiveness of the KT<sup>®</sup> method and its effect should not be overestimated (Hassan et al., 2019).

Furthermore, the available research in pediatric rehabilitative practice that employed the KT<sup>®</sup> method is skewed to children with cerebral palsy (Güçhan & Mutlu, 2017; Ibrahim, 2015; Keklicek et al., 2015; Rastii et al., 2017; Simsek et al., 2011); the benefits of the KT<sup>®</sup> method applied in other conditions and contexts remain elusive. The research involving the KT<sup>®</sup> method for pediatric population is further limited by the small sample size, low intervention fidelity, incomplete description of the qualifications of applicator, high variability in application methods, and poor reproducibility (Chang et al., 2010; Halseth et al., 2004; Güçhan & Mutlu, 2017; Rastii et al., 2017; Williams et al., 2012). To add to the existing body of literature examining the KT<sup>®</sup> method applied with pediatric population, the current study investigated the feasibility and efficacy of the KT<sup>®</sup> method combined with traditional OT in improving functional hand outcomes of a child with hypotonia.

### ***Aim of the Study***

This pilot study was designed to examine the feasibility and efficacy of applying the KT<sup>®</sup> method as part of traditional OT for a child with hypotonia. The researchers specifically investigated the functional hand outcomes (i.e., manual dexterity and grasp pattern) observed between the OT sessions with and without the application of the KT<sup>®</sup> method. The study aimed to generate meaningful implications using the KT<sup>®</sup> method as related to clinical practice and research within the profession of OT.

**Figure 1.**  
*The Functional Grasp Pattern Rating Scale – Pennies*

Watch how the child grasps a penny at the beginning of each trial.  
 A trial is consisted of picking up a penny, switching the penny between hands, and dropping the penny into a container.

Score 1 if the child picks up the penny using pincer or tripod grasp with defined web space between 1st and 2nd digits (see picture).  
 Score 0 if the child picks up the penny **not** using pincer or tripod grasp with defined web space between 1st and 2nd digits (see picture).



Trial #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Grasp Score															

**Methods**

*Study Design*

In the current exploratory study, the researchers employed a single-subject experimental design to determine the feasibility of the intervention and outcome measures in anticipation of a future, large-study involving the KT<sup>®</sup> method. The study specifically employed the alternating treatment design (Kratcohwil & Levin, 2010; Swanson & Sachse-Lee, 2000), which allows for comparison of outcomes between two treatment conditions: (a) OT intervention without the KT<sup>®</sup> Method (control condition) and (b) OT intervention with the KT<sup>®</sup> Method (experimental condition). Comprised of three distinct phases of baseline, alternating treatment, and replication, the alternating treatment design allows for visual analysis of the intervention effect and ascertains reproducibility of the observed change without requiring phases of treatment withdrawal (Barlow & Hayes, 1979; Byiers et al., 2012; Kratcohwil & Levin, 2010; Swanson & Sachse-Lee, 2000). This study was reviewed

and approved by the local Institutional Review Board.

*Outcome Measures*

After the treatment sessions across the baseline, alternating treatment, and replication phases, a team of blinded, graduate-level OT students administered standardized post-treatment assessments. To measure manual dexterity, the participant completed the five tasks within the Manual Dexterity Subtest of the BOT-2: making dots in circles (Dots), transferring pennies (Pennies), placing pegs on a pegboard (Pegs), sorting cards (Cards), and stringing blocks (Blocks). The number of dots, pennies, pegs, cards, and blocks successfully achieved within 15 seconds was recorded; all tasks were administered within 10 minutes. Based on the correlations for analysis of reliability, the BOT-2 has an inter-rater reliability of >.90 (except for the Fine Motor Precision subtest) and a test-retest reliability of >.80; internal consistencies are acceptable for all age groups at >.80 (Bruininks & Bruininks, 2005; Deitz et al., 2007). The validity of the instrument was supported by numerous tests

that ascertained its ability to discriminate motor performance of various diagnostic groups and its concurrent relationship with other measures of motor performance (Deitz et al., 2007).

The Functional Grasp Pattern Rating Scale was developed by the authors of the current study as a pilot instrument to analyze the quality of grasp patterns exhibited by the participant during the Manual Dexterity Subtest of the BOT-2 administration (see Figure 1).

For each trial the participant received a score of zero if the anticipated grasp was absent across the five tasks of Dots, Pennies, Pegs, Cards, and Blocks. The percentage of the time where the participant exhibited the modeled grasp during each task was calculated using the raw grasp scores (i.e., the number of successful trials where the modeled grasp was observed / the total number of successful trials x100). A team of blinded, graduate-level OT students were trained on using the Grasp Pattern Rating Scale until the inter-rater reliability of 90% was achieved on a series of 10 demonstration videos. Following training, researchers watched recordings of the study participant completing the Manual Dexterity Subtest of the BOT-2 across the baseline, alternating treatment, and replication phases and assessed the grasp pattern using this tool.

### ***Participant***

The study utilized purposive sampling for participant recruitment with the inclusion criteria of age within the range of 3-12 years, clinical diagnosis of hypotonia, documented history of delayed motor development, and access to transportation resources to visit the intervention site at least two times per week. The study excluded any potential participants who exhibited significantly compromised sensory systems, history of allergy with adhesive tapes, and contraindicated conditions including integumentary and vascular diseases.

The recruitment flyer was disseminated to surrounding outpatient pediatric clinics located within 30 miles of the intervention site for two weeks. All potential candidates and their parents or legal guardians were interviewed in person and screened based on the inclusion and exclusion criteria of the study. Only one parent-child dyad satisfied the inclusion and exclusion criteria; the dyad completed all steps required in the informed consent process prior to enrollment into the study.

The participant was a 9-year and 5-month-old Caucasian male with diagnoses of hypotonia, global developmental delay, and autism spectrum disorder. At the time of the enrollment, the participant reported receiving traditional OT services for 60 minutes at a frequency of twice per month for approximately two years. The participant's primary goals addressed in OT, as reported by the parent, included increasing grasp strength, fine-motor skills, and independence with dressing and utensil management skills.

### ***Data Collection***

During the baseline phase, there were no interventions provided. The participant was immediately escorted to the assessment room and administered the Manual Dexterity Subtest of the BOT-2 following a standardized set up. This assessment session was digitally recorded for retrospective analysis using the Functional Grasp Pattern Rating Scale. The baseline data was collected across three sessions over a three-week period and analyzed for stability; by establishing a stable baseline, the maturation effect was controlled to increase the validity of the intervention effect.

During the alternating treatment phase, the participant was randomly assigned to either the control condition (OT intervention without the KT<sup>®</sup> Method) or the experimental condition (OT intervention with the KT<sup>®</sup> Method). A

manualized, 30-minute OT intervention was provided by a pediatric OT practitioner for both the Control and experimental conditions; the only difference between the two treatment conditions was the presence of the KT<sup>®</sup> method. In the experimental condition, the KT<sup>®</sup> method was applied by the pediatric OT practitioner who is certified in the KT<sup>®</sup> method to correct any atypical characteristics associated with hypotonia and promote optimal alignment and stability of the involved muscles (see Figure 2). The application technique and pattern were verified by two independent Certified Kinesio<sup>®</sup> Taping Instructors for validity at the start of the study.

Immediately following the 30-minute OT session provided in the Control and the experimental conditions, the participant was administered the Manual Dexterity Subtest of the BOT-2, which was digitally recorded. The participant was removed of all pieces of Kinesio<sup>®</sup> tape applied prior to entering the assessment room to ensure blindness of the team of researchers. The data was collected across eight treatment sessions over an eight-week period.

The preliminary data analysis from the alternating treatment phase resulted in higher performance outcomes for the experimental condition. Therefore, the experimental condition was implemented during the replication phase. The participant completed the Manual Dexterity Subtest of the BOT-2, as completed during the baseline and alternating treatment phases, to confirm the reproducibility of the observed intervention effect. The replication phase was completed across three sessions over a three-week period.

### **Data Analysis**

At the end of the 14 sessions provided across the baseline, alternating treatment, and

**Figure 2.**  
*The Kinesio<sup>®</sup> Taping Method Applied to the Participant of the Study*



*Note: The top picture displays the participant's right hand in sagittal plane during the control condition. The bottom picture displays the participant's left hand in sagittal plane during the experimental condition.*

replication phases, 14 video recordings of the assessments, 14 sets of the Manual Dexterity Subtest of the BOT-2 scores, and 14 sets of the Functional Grasp Pattern Rating Scale scores were generated. The collected data was analyzed using descriptive and inferential statistics via the Statistical Package for the Social Sciences software. The mean of the study and between the Control and experimental conditions.

**Table 1.**  
*Mean Successful Trials Across Baseline, Alternating Treatment, and Replication Phases*

	Baseline	Alternating Treatment		Replication
		Control	Experimental	
Dots	17.33	16.25	16.75*	18.33
Pennies	6	6	7*	5.33
Pegs	5.67	3.75	3.25	3.67
Cards	7.67	5.75	8.5*	5.33
Blocks	2.67	3	3	2.33

*Note.* Tasks denoted with an asterisk indicate higher average of the successful trials observed between the Control and experimental conditions.

## Results

### *The Manual Dexterity Subtest of the BOT-2*

Table 1 displays the average number of successful trials observed across the five tasks on the Manual Dexterity Subtest of the BOT-2 during the baseline, alternating treatment (the Control and experimental conditions), and replication phases.

When comparing the mean successful trials achieved among the baseline, alternating treatment, and replication phases via visual analysis, there were no consistent, noteworthy patterns observed across the five tasks of Dots, Pennies, Pegs, Cards, and Blocks. When comparing the mean successful trials achieved between the Control and experimental conditions during the alternating treatment phase, the experimental condition yielded a higher average than the control condition in three out of the five tasks.

A one-way ANOVA analysis was conducted to analyze whether there were significant differences in the mean scores achieved across the baseline, alternating treatment (the Control and experimental conditions), and replication phases. There were no statistically significant differences observed among the four groups on the manual dexterity scores achieved on the tasks of Dots ( $F(3,10) = .194, p = .898$ ), Pennies ( $F(3,10) = 3.605, p = .058$ ), Pegs ( $F(3,10) = 3.436, p = .060$ ), Cards ( $F(3,10) = 1.224, p = .351$ ), and Blocks ( $F(3,10) = .640, p = .606$ ).

### *The Functional Grasp Pattern Scale*

The results from the descriptive analysis revealed the following average grasp percentage scores for the five tasks of Pennies ( $m = 90\%$ ), Pegs ( $m = 100\%$ ), Blocks ( $m = 67\%$ ), and Cards ( $m = 100\%$ ) during the baseline phase. During the alternating treatment phase, the control condition yielded the following average grasp percentage scores

for the tasks of Pennies ( $m = 83\%$ ), Pegs ( $m = 95\%$ ), Blocks ( $m = 69\%$ ), and Cards ( $m = 73\%$ ). In the experimental condition, the following average grasp percentage scores were achieved for the tasks of Pennies ( $m = 93\%$ ), Pegs ( $m = 67\%$ ), Blocks ( $m = 29\%$ ), and Cards ( $m = 75\%$ ). During the replication phase, the following average grasp percentage scores were achieved for the tasks of Pennies ( $m = 80\%$ ), Pegs ( $m = 87\%$ ), Blocks ( $m = 72\%$ ), and Cards ( $m = 85\%$ ).

A one-way ANOVA analysis was conducted to analyze whether there were significant differences in the mean percentage scores achieved on the grasp pattern across the baseline, alternating treatment (the Control and experimental conditions), and replication phases. There were no statistically significant differences observed among the four groups on the percentages achieved on the tasks of Pennies ( $F(3,10) = .248, p = .864$ ), Pegs ( $F(3,10) = .999, p = .433$ ), Cards ( $F(3,10) = .510, p = .685$ ), and Blocks ( $F(3,10) = 1.117, p = .388$ ).

## **Discussion**

Overall, there were no statistically significant differences observed in the functional hand outcomes among the three phases of the study and between the OT sessions delivered with the KT<sup>®</sup> Method and without the KT<sup>®</sup> Method. The insignificant findings from the study are consistent with the mixed empirical findings reported in the existing literature on the KT<sup>®</sup> Method (Kaur et al., 2016; Morris et al., 2013; Mostsafavifar et al., 2012; Parreira et al., 2004; Williams et al., 2012).

Specifically, Keklicek et al. (2015) explored the carryover effect of the taping method 20 minutes post-intervention after the application was removed. There was no consistent carryover effect observed in upper extremity function after the application was removed

(Keklicek et al., 2015), which is supported by the current study where no immediate changes were observed after the KT<sup>®</sup> Method was removed. While there is an emerging body of literature supporting the KT<sup>®</sup> method in improving functional hand outcomes for pediatric population with various neuromuscular conditions (Ibrahim, 2015; Öhman, 2012; Rastii et al., 2007; Simek et al., 2011 2017; Yasukawa et al., 2006), these more positive outcomes were not replicated in the current study.

This pilot case study was limited by significant novelty effect as well as employment of a standardized measure that required optimal organization of behavior in addition to motor skills. The novelty effect is observed when a participant is presented a new stimulus that is initially motivating and engaging, but with repeat exposures, the stimulus becomes gradually less motivating as the initial excitement fades away (Creswell & Creswell, 2017); this pattern of behavior is confirmed by the higher achievement outcomes observed in some of the tasks during the baseline phase when the participant was first introduced to the intervention and the assessment tasks. Other limitations of the study include the small sample size ( $N = 1$ ), fluctuating moods and behaviors exhibited by the participant across the 14 sessions, and subjective human judgement and human error potentially involved during the data collection and analyses. These limitations were attempted to be mitigated by using the standardized intervention protocol and ensuring the blindness of the evaluators throughout the study.

Furthermore, the selected standardized measure, the Manual Dexterity Subtest of the BOT-2, may have induced fatigue on the participant due to the number of tasks required to complete under time pressure in one sitting. In the future studies, selecting standardized

assessments and measures that are simplified with less organizational and attentional demands is recommended.

## Conclusion

In this exploratory, pilot study, we investigated the feasibility and efficacy of applying the KT<sup>®</sup> method in conjunction with traditional OT intervention to address functional hand outcomes for a child with hypotonia. There were no statistically significant functional hand outcomes gained from applying the KT<sup>®</sup> method. The results from this study replicated the mixed outcomes reported in the existing body of literature involving the KT<sup>®</sup> method. This study adds to the literature on the potential use of the KT<sup>®</sup> method as a supplementary tool in the delivery of traditional OT services, which remains inconclusive.

Future research involving the KT<sup>®</sup> method can consider ways to better control for the novelty effect. To mitigate this confounding variable, researchers can consider embedding warm-up activities to allow ample opportunities for the subject to habituate to the task and environment before measurement or measuring the subject's performance after several practice trials. In addition, researchers can consider employment of instruments that measure motor skills without requiring additional skill sets, especially when involving a participant with comorbid conditions. Future studies involving single-subject alternating treatment design can also consider manipulating conditions (i.e., number of sessions or length of each session provided across the baseline, alternating treatment, and replication phases) to explore if increased intensity in the application of the KT<sup>®</sup> method can yield meaningful outcomes.

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