

# A Single Session of NCK Therapy in Ameliorating Excessive Pressure while Writing in a Child with Writing Difficulty: A Case Study

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**Abstract:** *It is well known fact that there is no cure for Specific Learning Disability (SLD) and it needs life-long consistent training to sustain the improvement induced by specific therapy/remedial training. Especially when it comes to dysgraphia, one of the symptoms which induce more suffering is pain while writing due to excessive pressure given by the child. A boy aged 10 years was referred for evaluation and remedy for writing difficulty. Through several years of observation, therapeutic practice and review of literature, a new therapy was designed and attempted to ameliorate the excessive pressure in just a single therapy session. This new therapy was given a name NCK therapy as it involves neuro-cognitive-kinesthetic components. With this therapy, the child was able to write at ease, without excessive pressure and pain, within the short span of one hour. Then his writing will be further improved with pre-writing strokes, letter construction, word building and speed.*

**Keywords:** Dysgraphia, writing disorder, ameliorating excessive pressure, movement, neuro-cognitive-kinesthetic therapy.

## 1. Introduction

Chivers (1991) defines dysgraphia as the deficiency in the ability to write, primarily in terms of handwriting, but also in terms of coherence. The word dysgraphia comes from the Greek words dys meaning "impaired" and graphia meaning "writing by hand" (Berninger and Wolf, 2009). Dysgraphia is a specific learning disability in which our ability to express ourselves through written language is impaired. In a simple way, dysgraphia describes difficulty in writing. Dysgraphia is not the result of an intellectual impairment nor is it dependent upon the ability to read. Dysgraphia has the potential to cause problems with spelling, organizing words on a page and putting one's thoughts on paper.

According to DSM-IV, Dysgraphia is characterized as a learning disability in the category of written expression when one's writing skills are below those expected given a person's age measure through intelligence and age appropriate education. According to ICD-10, the term dysgraphia is not in use but Specific Developmental Disorder of Motor Function which includes clumsy child syndrome, developmental coordination disorder and developmental dyspraxia.

In general, children with dysgraphia might exhibit symptoms of dyspraxia, but Berninger et al (2008) viewed dysgraphia as a comorbidity of dyspraxia or otherwise called Developmental Coordination Disorder (DCD). They also come to the conclusion that DCD lead to deficits in fine motor coordination which manifest difficulty in learning basic movement patterns, developing a desired writing speed, establishing a correct pencil grip and acquisition of graphemes e.g. letters of Latin alphabets and numbers. It is also very common among children with dysgraphia that they tend to avoid writing by frequently going for urination, demanding for water and taking a break from writing by complaining of leg pain, finger pain etc.

Though several studies have been conducted during the last 2 to 3 decades focused on the causes, neuropsychological correlations, cognition, symptoms, handedness, visuo-motor coordination etc. on dysgraphia, a very few researches on therapy were cited in the literature. Beeson (2004) identified that written communication involves the linking of ideas and words to their appropriate spellings and then moving the hand to actually write the desired word but didn't focus on the motor coordination or on the pain while writing. Engel-Yeger and Rosenblum (2010) found that tripod-pinch strength was lower in children with dysgraphia compared with normally developing children. So they attempted with protracted graphomotor tasks on tripod pinch strength and handwriting performance in children with dysgraphia and concluded that combining the pinch factor with an evaluation of handwriting's process and product may supply a better insight about the child's deficits and assist in focusing treatment objectives.

This present study is to focus on the combination of neuro-cognitive-kinesthetic components in ameliorating the excessive pressure given by the child while writing. Keeping the factor in mind that if the excessive pressure is ameliorated then the pain will be relieved and when the pain is relieved the task of writing will be much easier for the child.

As one of the components is neuro, let us see some of the articles that speak on effects of psychotherapy on brain. Levine and Reed (1999) pointed out the cortical lobes and their significant roles on writing skills as follows:

- 1) Occipital: Vision center of our brain.
- 2) Parietal: Processes sensory and spatial information plays crucial role in hand writing and visuo-motor integration skills.
- 3) Temporal: Houses language and memory functions.
- 4) Frontal: Executive functions such as planning and organization skills, self monitoring, attention to task and strategy formation skills.

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- 5) Motor cortex: Execution of motoric act of writing.
- 6) Pre-motor cortex: Planning of sequential motor response.
- 7) Basal ganglia: Automaticity of handwriting.
- 8) Dorso-lateral Pre-frontal cortex: Self monitors response.

Linden (2006) researched on the effects of psychotherapy on brain with the evidence of functional neuroimaging while giving therapy for patients with OCD, Phobias and Panic disorders and Major Depressive Disorder. Finally, the evidence based Bobath concept was considered as an inspiration as it was widely used in adult patients with strokes and children with cerebral palsy which explains about normal movement, motor learning and the neuronal plasticity (Tatjana & Milivoj 2005). But the combination of this sort (neuro-cognitive-kinesthetic) of therapy was not tried to ameliorate the excessive pressure or improving writing skill of children with dysgraphia and not cited anywhere in the literature till date.

## 2. Materials and Procedure

Master M.G. aged 10 years was referred with the chief complaint of difficulty in writing and avoiding the same. On evaluation he was found to have writing difficulty (dysgraphia) with poor motor coordination (dyspraxia). Initially he was asked to write his name and a simple sentence in English and when he wrote, the impression was seen even after 4 papers beneath i.e. on the fifth page (carbon paper was used to trace the impression).

Keeping in mind the well known fact that all children with specific learning disability have problem in attention and concentration, he was given attention enhancing tasks viz. grain sorting, beading, letter cancellation and coloring within the boundary (Rejani, et al. 2012 and Vahali, 1993). The child was executing the tasks of grain sorting and beading at ease. But in letter cancellation and coloring he felt difficulty in executing the task. So the child was asked to follow penmanship (holding the pencil with tripod coordination, one inch away from the tip and keeping the note book by turning towards his left so that the diagonal of the note book will be perpendicular to him). Still he was feeling difficult as he was giving excessive pressure while cancelling the letters and coloring. So the child was asked to remove the middle finger from the tripod coordination as he was giving excessive pressure with his middle finger anticipating that the pencil might slip down from his grip. Then he was assured that the length of the pencil will rest on thenar muscles and will not fall off. Then he was instructed to hold the pencil as he was taking the grain or bead with his thumb and index fingers for cancelling the letters and coloring. As he was feeling comfortable with all the tasks, coloring task was complicated a little further, i.e., instead of coloring a simple geometric shapes viz. circle, square and triangle he was instructed to color/shade a narrow vertical rectangle in a horizontal manner, within the boundary that too very lightly. Once he achieved this then he was instructed to shade a narrow horizontal rectangle in a vertical manner, within the boundary very lightly by resting his hypothenar muscles on the table and keeping middle finger beneath the pencil just for support (this position is the normal position and movement for writing).

The rationale for naming the therapy as NCK therapy as follows:

As his coloring/shading (movement) was guided, controlled and supervised: Kinesthetic.

As he was asked to keep in mind how to hold the pencil, where to color, how to color: Cognitive.

As these components induce changes in the brain (feedback) so that the brain will execute the task of writing without excessive pressure and pain: Neuro.

With this Neuro-Cognitive-Kinesthetic therapy, within one hour's duration, the child was able to write without any pressure and pain.

## 3. Result and Discussion

The father was very happy with the change in the child's writing as he was very much witnessing the procedure and its outcome. The impression of his writing on the paper was only visible but not felt even at the back of the very same paper. Once the excessive pressure is ameliorated and pain is relieved, further therapeutic activities will be easier. Hence, father was advised to continue the procedure at home regularly so that this pattern of moving his hand for proper writing might become habituated. A week later, the child reported with father for a review, gave the feedback that he was feeling very comfortable with shading and completely relieved from pressure and pain. As the child was feeling comfortable, father was taught, explained and demonstrated how to train the child further with pre-writing strokes, letter construction, word building and lastly focusing on speed to improve his writing skills.

## 4. Summary and Conclusion

NCK therapy is proved to be very effective with a single case study that too in single session. Years of clinical practice, query, need for innovation, search of relevant literature and dedication involved in the journey of achieving this goal. Even though the result of NCK therapy is very promising, the individual difference also might have influenced the therapeutic outcome i.e., the child's cooperation, ability to comprehend the instructions properly and his patience to sit for the entire session. So to generalize the effect of NCK therapy this should be applied to a larger sample and even further to compare with other treatment methods to check the efficacy is suggested.

## 5. Limitation

Unfortunately, the child didn't turn up for further follow up session as the father knew how to train the child and he was very busy with his business.

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