



A COMPARATIVE STUDY OF TWO DIFFERENT WEIGHTED VESTS AND ITS EFFECT ON ATTENTION SPAN IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVE DISORDER

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ABSTRACT

ADHD is characterized by developmentally inappropriate impulsivity, inattention, and hyperactivity. This study describes the comparison about the effect of two different weighted vests and its increase on attention span in children with ADHD. This is a quantitative research model and convenient sampling procedure was done for the study. Twenty children with ADHD of age group of five to seven years and both genders were used for this study. Vanderbilt ADHD diagnosing parent rating scale (VADPRS) was used for screening. Twenty students with documented attention difficulties and hyperactivity were timed with a stopwatch to measure their on-task behavior during fine motor activities in the clinical setup. The results show that there is a statistical significance difference between 5% and 10% weighted vest in the Attention span at 95% [$P < 0.05$]. These preliminary findings support the hypothesis that wearing of increased weighted vest (10% of body weight) to apply deep pressure increases the task behavior than 5% of weighed vest during fine motor activities.

KEYWORDS: Weighted vest, attention deficit disorder with hyperactivity, attention, motor activities



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INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a neurobiological disorder that affects the emotions, behavior, and cognitive state of 4%–7% of children worldwide¹. Attention deficit hyperactivity disorder, or ADHD, is a significant problem among school children. ADHD is characterized by developmentally inappropriate impulsivity, inattention, and hyperactivity. Hyperactivity may be seen as (a) fidgety behavior or difficulty sitting still, (b) excessive running or climbing when not appropriate, (c) not remaining seated when asked to, (d) having difficulty enjoying quiet activities, (e) appearing to be "constantly on the go," or (f) excessive talking. Their impulsivity may also lead to accidents or engaging in high risk behavior without consideration of the consequences. Executive dysfunction is a main deficit in ADHD; therefore, people with ADHD are at risk for significant limitations in occupational functioning². Weighted vest is clothing that adds weight to various parts of the body, usually as part of resistance training. The effect is achieved through attaching weighted pieces to the body (or to other garments). Weighted vests are used as a means of applying deep pressure, which can be helpful in decreasing purposeless behaviors, hyperactivity and inattention (often seen in autistic and ADHD children and those with sensory processing difficulties). Deep pressure stimulation has been used in therapeutic practice because of the assumption that it changes physiological arousal³. The deep pressure applied by the weighted Vest has a calming effect upon children that is comfortable to them, and provides an alternative or adjunct to medication. So, the present study is carried out to know whether 10% of body weighted vest is better than 5% of body weighted vest in improving the attention span.

MATERIALS AND METHODS

Convenient sampling procedure, quantitative approach and quasi experimental design were done for the study. The total sample size taken was twenty children with ADHD of age group of five to seven years. ADHD children with physical disabilities were excluded. The purpose of the study was well explained to the parents. The weight of each child was measured with weighing machine. Then the children were divided into two groups such as Group A (weighted vest based on 5% of body weight), Group B (weighted vest based on 10% of body weight). Using Vanderbilt ADHD diagnosing parent rating scale (VADPRS) 20 children were diagnosed and used for the study. They were divided among 2 groups Group A (weighted vest based on 5% of body weight) and Group B (weighted vest based on 5% of body weight). In each group there will be 10 children.

Instrumentation

Vanderbilt ADHD diagnosing parent rating scale (VADPRS) was used. It is screening questionnaire for attention deficit hyperactive children (ADHD). The VADPRS is reliable ($r = 0.80$), cost-effective assessment for ADHD in clinical and research settings. *Weighted*

vest were Denim vests that buttoned down the front. Inside Pockets were made on the vests so that weights could be placed into the pockets and would be evenly distributed. The pockets were positioned high enough on the chest anteriorly to prevent the weights from resting on the child's hips or legs when seated. A pocket was positioned posterior between the scapulae just below the scapular borders to ensure that the weight was supported from the shoulder girdle. The placement of the weights higher up on the shoulder girdle rather than predominately below chest level has been used successfully by other therapists, Olson L.J., & Moulton, H.J. (2004)⁴. Weights were purchased according to the weight of the child and placed into the interior pockets so that they were evenly distributed front and back, with a total weight as close to 5% and 10% of the child's body weight as possible. *Stopwatch* Was used to measure the amount of a child's attention in a particular activity in respect to time. *Weighing machine* Was used to measure the weight of the children for finding the weight of the vest.

Procedures

The purpose of the study was well explained to the parents. The weight of the each child was measured with weighing machine. Then the children are divided into two groups such as Group A (weighted vest based on 5% of body weight)

Group B (weighted vest based on 10% of body weight). Using Vanderbilt ADHD diagnosing parent rating scale (VADPRS) 20 children were diagnosed and used for the study. They were divided among 2 groups Group A and Group B. In each group there will be 10 children. The study was done for 10 days on each child under group A and group B. Using weighted vest prior to the activity, the Children were made to wear the vest for approximately 2 minutes. The time was extended until the child sustained his/her attention. At the end of 10th day pre test and post test were analyzed to find the effectiveness among group A and group B.

Data Analysis

To compare the data for analysis, each group identified following assessment with BBS and was coded under a category from the analysis of different variables of the research. Comparative and inferential statistical analysis has been carried out in the present study and results on continuous measurements are presented on Mean } SD (Min-Max), also, results on categorical measurements are presented in Number (%). Significance is assessed at P value <0.05 level of significance. The Statistical software, namely SPSS, Version 19.0, and Microsoft word and Excel have been used to generate graphs, table 1 (Fig 1), etc. Significant figures: + Suggestive significance (P value: 0.05 < P < 0.10), * moderately significant (P value: 0.01 < P ≤ 0.05), ** strongly significant (P value: P ≤ 0.01).

Ethical Consideration

This research was approved by the Research team of SRM University College of Occupational Therapy, Chennai following thorough scrutinization of the relevant papers and consent letter approval from all participants.

RESULTS

Table 1
Comparison between 5% and 10% weighted vest in respect to attention span.

	Group	N	Mean	SD	Independent T test	P value
Attention span	A-5%	10	7.93	2.242	4.483	0.00***
	B-10%	10	12.81	2.613		

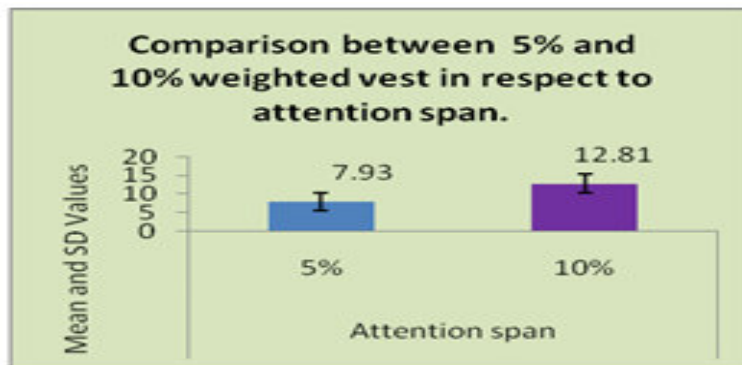


Figure 1
Independent “t” test was used to find whether a significant difference was seen between 5% and 10% of weighted vest in ADHD children. There was statistical significant difference seen between both the groups ($p=0.00$).

DISCUSSION

As done in previous studies 5% of weighted vest was given (VandenBerg, N. L,2001)⁵. The use of a weighted vest to increase on-task behavior in children with attention difficulties, (Fertel-Daly et.al, 2001)⁶ was carried out using 5% of the body weight. The weighted vest applies Deep pressure and also sends sensory information into the Purkinje cells in the cerebellum, which then work to dampen stimulation entering the reticular formation through brain chemistry or neurotransmitters (Myles, B. S., Simpson et al,2004)⁷. Purkinje cells are rich in serotonin and are responsible for inhibition of motor activity (Edelson, 1995)⁸. Children with ADHD have been found to have high levels of hyperactivity related to lower levels of serotonin in their blood (VandenBerg, N. L ,2001)⁹. Deep pressure may stimulate the increase in serotonin, as well as other neurotransmitters, to create a natural calming on the central nervous system in the child with ADHD. Weighted vests are used as a means of applying deep pressure, which can be helpful in decreasing purposeless behaviors, hyperactivity and inattention often seen in autistic and ADHD children and those with sensory processing difficulties. The deep pressure applied by the weighted Vest has a calming effect upon children that is comfortable to them, and provides an alternative or adjunct to medication. Many children when wearing the Vest for the first time and responded by saying, it feels good. Therefore it was also recommended to use increased amount of weight and it may increase the attention span. In our study the group with 10% of weighted vest was taken and the results

showed increased attention span compared with 5% of weighted vest ($P=0.000$).

Implications Clinical

The weighted vests can be used as a part of intervention for improving Attention in patient with attention deficit. This is owing to the fact that it's highly flexible to choose out the variety of activities available in practice to engage patient while using attention enhancing activities .Furthermore, weighted vests of 5% have shown greater impact and influence on development of attention as well as reducing hyperactive behaviors.

Administrative

The outcome of this study can be documented for administrative use in various establishments to guide therapist during intervention and to stream line choice of attention enhancing activities during assessment and use the appropriate weighted vests in order to improve attention

Research

Furthermore, this study serve as guideline for further researchers interested in improving attention deficits and decreasing hyperactive behaviors by using the apt weighted vest.

CONCLUSION

As children with ADHD experience cognitive and functional difficulties in their daily lives associated with Quality of Life improving the attention span is essential¹⁰. The use of a weighted vest with weight of 10% as a means of applying deep pressure sensory input is practical and more convenient than 5% for a clinical setup use. It is low cost and easily transported to therapy sessions with occupational therapists and other speech–language therapists and for use in other learning environments where optimal on-task behavior is required for maximal learning. This study supports the efficacy of using weighted Vests with 10% of weight on children with attention difficulties to increase on task behavior. A significant increase on-task behavior was demonstrated in 10 students when the weighted vests, calibrated at 10% of their individual body weight than 5% Of weighted vest, were used during the intervention phase.

Limitation

Because this study used a quantitative experimental design methodology and consisted of patients from a specific geographical location who had diverse ethnic and cultural backgrounds, the ability to generalize the results or assign causality to the outcomes is limited. The sample size is limited, another important factor is retrospective analysis of the study will give a wider range of improvement rather than the short duration of study and intervention, Also the outcome of this study is subjected to variability in different set-up use for the study. In addition, Language and communication barrier account for error at the initial stage of the study.

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Suggestions for future research

Future studies should examine the present study and consider it in a larger population for more accurate result. In further studies, gender wise distribution of patient selection, duration of intervention can be increased in future research to elicit progress. In further studies it is recommended that at least three months retrospective follow up should be done to see the overall improvement of attention while using the weighted vests and to find out the long term effect of Occupational therapy services. This study included only with fine motor activities, this we can change to gross motor activities or any other activities and check the attention span of the children.

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CONFLICT OF INTEREST

Conflict of interest declared none