

I AM FOR ADHD: An Exploration in the Lives of and its Effects in Children with ADHD

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Asian Conference on Psychology and the Behavioral Sciences 2015
Official Conference Proceedings

Abstract

With multiple economic problems burdening the Philippines, managing children with ADHD entails not only effort and time but greater financial challenges as well. Many children rarely sustain medications to alleviate their difficulties and are faced with inability to have continuous therapy sessions. Conducted in a public school in Manila that caters pupils who belong to considerably low socio-economic status, this study shed light on the various difficulties in the executive functions of children with ADHD. Having the case study approach as basis, this study came up with the P.A.C.E. for Children with ADHD (Psychoeducation and Cognitive Exercises for Children with ADHD). This program consists of a combination of psychoeducation and cognitive skills exercises (bimodal) for one hour each session in three (3) months. Employing the true experimental design, the Behavioral Rating Inventory of Executive Functions (BRIEF) completed by parents, measured changes in the executive functions, which are the usual difficulties especially in school of the children with ADHD. Overall, this study has shown that P.A.C.E. made considerable effects in the executive functions. It has shown significant differences in 5 out of the 8 scales of BRIEF, specifically in shift, working memory, inhibit, plan and monitor scales. With the regular but minimal supervision of psychologists, the activities in the P.A.C.E. can be done by parents in the comforts of their homes, thus, helping the families who are not able to avail professional services offered by private clinics. The study can also broaden horizons in research, education and practice.

Keywords: ADHD, Executive Functions, BRIEF, Psychoeducation, Cognitive Exercises

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Introduction

Inattentiveness, hyperactivity, impulsiveness are the core evidences that a child has what is known as Attention Deficit Hyperactivity Disorder (ADHD). Behaviors in children such as failure to give close attention to details, making careless mistakes in schoolwork, difficulty to sustain attention in play activities or other tasks, inaccurate work, looking elsewhere and not seeming to listen when spoken to directly, difficulty in learning and organizing tasks, getting often easily distracted by extraneous stimuli, being forgetful, fidgeting with hands or squirming in one's seat, excessive talking and feelings of restlessness (DSM-V [APA, 2014]) are some of the various symptoms of ADHD. Above all these, it is the deficits in executive functions or the high-level cognitive processes affecting goal-directed behaviors, which are at the core of ADHD (Holmes et. al., 2010 and Thorell et al, 2010). While cognitive measures of executive function are helpful as diagnostic tools, one can also conclude that in order to help children with ADHD, the areas that must be treated directly and dynamically are the executive functions.

Being a Third World country, managing children with ADHD in the Philippines entails a lot of challenges and financial sacrifices. Parents of these children suffer from the inability to provide medications and avail professional services offered by private clinics. They have to rely to whatever programs that could alleviate the difficulties they undergo in managing their burdensome situation and the special condition of their children. The same predicament also carries with it the lack of proper or appropriate knowledge regarding the nature and possible help in dealing with such difficulties.

The participants together with their parents reported some difficulties experienced that are directly linked to the executive functions. Children with ADHD are easily distracted by extraneous stimuli, have problems organizing activities, and lack inhibitory control (Gawrilow, Gollwitzer & Oettinger, 2011). Prominent theories on ADHD suggest that ADHD symptoms arise from deficits in executive functions because these deficits reliably differentiate children with ADHD from children without ADHD (Barkley, 1997 as cited by Gawrilow, Gollwitzer & Oettinger, 2011). Weakness in the executive functions is considered to be the explanation why there is persistent difficulty in the academic development of children with ADHD (Biederman, et al, 2004 as mentioned in Huang – Pollock & Karalunas, 2010).

Recent studies show that two of the most effective ways to improve these functions in the children with ADHD are psychoeducation and cognitive exercises. Psychoeducation is widely accepted as it fits very well with the medical model of illness by being clinically focused common sense-based intervention (Colom, 2011 as cited by Morokuma et. al, 2013). Moreover, it is relatively simple and can be administered by therapists of various disciplines without extensive training (Morokuma et al, 2013). On the other hand, cognitive training and exercises like puzzle, memory games and similar computer-based games provide significant improvement in the academic performance, complex reasoning skills, attention, impulse control and even social functioning of children with ADHD (Rapport, et al., 2013).

With some hope for the children with ADHD and their parents, this study sheds light on their real conditions and paves the way for the creation of Psychoeducation and Cognitive Exercises (PACE) for Children with ADHD. The program seeks to contribute to majority of the scales in the participants' executive functions as measured by BRIEF (Behavior Rating Inventory of Executive Functions). This paper also broadens the horizon for further research and investigations.

Research Design

Participants

20 children between the ages of 5 to 13 were recruited from P. Burgos Elementary School, through the recommendation of the City of Manila Division of the Department of Education (N control = 10; N experimental = 10). The participants were enrolled under the Silahis ng Pag-ibig division which is mainly for children with special needs. Through the endorsement of the Principal, participants who possessed the inclusion criteria were identified. They are those who submitted a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) duly certified by psychologists and or psychiatrists, not taking any medications for the last 6 months and during the course of the study. The parents were provided with informed consent and the children gave verbal assent prior to their participation.

Instrument

BRIEF (Behavior Rating Inventory of Executive Function) Parent Form enables the professionals to assess executive function behaviours in the home and school environments. This is to be completed by parents and teachers. It is designed for a broad range of children, ages 5 to 18 years old, with various conditions such as learning disabilities and attentional disorders, traumatic brain injuries, lead exposure, pervasive developmental disorders, depression and other developmental, neurological, psychiatric and medical conditions. Both forms contain 86 items within eight theoretically and empirically derived clinical scales that measure different aspects of executive functioning. It was designed to be used for a wide range of childhood disorders in order to augment traditional clinic - based assessments and to provide an increased level of ecological validity for clinical assessments (Rabbitt, 1997 as cited by Mahone et al., 2002). The form consists of 86 items and the parents rate their child's behaviour on a three-point Likert scale (never, sometimes, often). The questionnaire consists of eight scales namely Initiate, Working memory, Plan/organize, Organization of materials, Monitor, Inhibit, Shift and Emotional Control. The raw scores can be translated in T-score and percentile and can be interpreted as the higher the scores on each scale, the greater would be the perceived impairment. For all the clinical scales and indexes, T scores at or above 65 should be considered as having potential clinical significance. Mean internal consistency ratings reported for clinical populations using the BRIEF Parent Form range from .82 to .98. Three-week test-retest correlations for clinical populations on the Parent Form range from .72 to .84 (Mahone, et.al, 2001). For the purposes of this study, all the scales were utilised since interpretive significance on individual items is not recommended due to lower reliability of individual items relative to the scales.

Program

P.A.C.E. or Psychoeducation and Cognitive Skills Exercises for Children with A.D.H.D. is the name of the intervention. In the English language, “pace” as a verb means walking at a steady speed. The program was named as such since there were set of activities planned out for the whole duration however the activities were adjusted depending on the pacing or progress of the participants. In this way, the participants were given longer time in activities that they enjoy and or activities that need more time and practice.

The activities were facilitated individually majority of the time hence there were times they were facilitated by pair depending on the nature of the activities. Completed for 12 weeks, the program was facilitated twice a week with one hour per session. The activities utilized various cognitive skill exercises (e.g. solving puzzle, arranging objects, memory games) and psychoeducation (what ADHD is, why am I special, etc).

Procedure

A permission was sought from the City Division of Manila, in order to conduct the intervention program in P. Burgos Elementary School. After the identification of potential participants, informed consent were given to parents and or guardians. The parents were oriented on the details of the program, its possible effects and the commitment that may be required from them in participating in the study. Participants and parents who agreed were randomly assigned in the control and experimental groups. The members of the control group attended the special education classes handled by their respective teachers while the members of the experimental group were given the P.A.C.E. (Psychoeducation and Cognitive Skills Exercises). Prior to the start of the intervention program, all the parents were given the Behavior Rating Inventory of Executive Function. P.A.C.E was conducted for 12 weeks and post-test was given to the parents.

Results

Demographic data for the control and experimental groups were compared (Table 1). Majority of the participants were in the ages between 11 - 13 and are equally coming from Classes D and E in terms of the socio economic status. All of the participants were male.

Table 2 provides the means and SDs for measure of each scale. The groups were compared using t-tests and significant levels were also shown. Among all the eight scales of the BRIEF test, the scale on *shift, working memory, inhibit, plan and monitor* were found to be significant after the facilitation of the P.A.C.E. program.

Shift Scale

This scale assesses the ability to move freely from one situation, activity, or aspect of a problem to another as the circumstances demand. Monsell (1996) sees shift as one of the common groups of executive functions which includes the shifting back and forth between multiple tasks or mental sets. Children with ADHD also have

difficulties performing tasks that require shifting between mental sets and therefore consistently exhibit poorer performances on the Wisconsin Card Sorting Test (WCST; e.g., Grant & Berg, 1948 as cited by Thorell et al, 2010)

The participants who experienced the P.A.C.E program shows improvement in this area (*Baseline of 13.6 and Posttreatment of 12.4*). While the group who just continued the usual academic program, does not show significant change (*Baseline of 15.3 and Posttreatment of 15.2*).

Working Memory

The items from this scale measure the capacity to hold information in mind for the purpose of completing a task. They can be describe with weak working memory as having trouble in remembering things even for a few seconds, losing track of what they are supposed to retrieve when sent. Working memory deficits have been widely and repeatedly documented in children with ADHD (Klingberg et al., 2005 as cited by Gawrilow, Gollwitzer, & Oettingen, 2011). Results suggest a weakened general working memory in children with ADHD (Martinussen, Hayden, Hogg-Johnson, & Tannock, 2005; Martinussen & Tannock, 2006 as cited by Gawrilow, Gollwitzer, & Oettingen, 2011) as well as more specific working memory deficits (e.g., rehearsal of verbal and spatial information; Karatekin, 2004 as cited by Gawrilow, Gollwitzer, & Oettingen, 2011).

The participants who experienced the P.A.C.E program shows improvement in this area (*Baseline of 18.2 and Posttreatment of 15.2*). While the group who just continued the usual academic program, does not show significant change (*Baseline of 17.9 and Posttreatment of 16.8*).

Inhibit

This scale assesses the ability to stop one's own behaviour at the appropriate time. Inhibition involves the ability to inhibit dominant, automatic, or pre-potent responses. A typical inhibition task is the Stop Signal task (Logan & Cowan, 1984 as cited by Gawrilow, Gollwitzer, & Oettingen, 2011). In trials with a stop signal, participants are required to inhibit their response. Children with ADHD have difficulties to inhibit their response on stop trials and show a prolonged reaction time on Go trials as compared to children without ADHD and without any psychiatric diagnosis (Lijffijt et al., 2005 as cited by Gawrilow, Gollwitzer, & Oettingen, 2011).

The participants who experienced the P.A.C.E program shows improvement in this area (*Baseline of 18.5 and Posttreatment of 16.7*). While the group who just continued the usual academic program, does not show significant change (*Baseline of 18.6 and Posttreatment of 18.3*).

Plan/Organize

This scale measures the child ability to manage current and future-oriented task demands. The plan component of this scale refers to the ability to anticipate future events, set goals and develop appropriate steps ahead of time to carry out a task or activity. It often requires sequencing or stringing together a series of steps. The

organising component relates to the ability to bring order to information and to appreciate main ideas or key concepts when learning or communicating information. This involves the ability to organise oral and written expression, as well as to understand main points expressed in presentations or written material,

The participants who experienced the P.A.C.E program shows improvement in this area (*Baseline of 27.1 and Posttreatment of 24.5*). While the group who just continued the usual academic program, does not show significant change (*Baseline of 22.7 and Posttreatment of 22.4*).

Monitor

This scale assesses work checking habit. They can be described as rushing through work, making careless mistakes and failing to check work.

The participants who experienced the P.A.C.E program shows improvement in this area (*Baseline of 14.7 and Posttreatment of 24.5*). While the group who just continued the usual academic program, does not show significant change (*Baseline of 22.7 and Posttreatment of 12.9*).

Emotional Control

This scale addresses the manifestation of executive functions within the emotional realm and assesses a child's ability to modulate emotional responses. They may be observed as a child who cries easily or laughs hysterically with small provocation or severity that is not age appropriate.

The participants who experienced the P.A.C.E program shows a decrease in the level of deficit but not significant (*Baseline of 21.3 and Posttreatment of 20.2*). While the group who just continued the usual academic program, did not improve at all in this domain (*Baseline of 21.4 and Posttreatment of 22.1*).

Initiate

This scale contains items relating to beginning a task or activity as well as independently generating ideas, responses or problem solving strategies. The children are described as having difficulties with getting started on homework or chores and there is a need for extensive prompts or cues in order to begin a task or activity.

The participants who experienced the P.A.C.E program shows a decrease in the level of deficit but not significant (*Baseline of 13.8 and Posttreatment of 13.5*). While the group who just continued the usual academic program, did not show any significant change (*Baseline of 17.1 and Posttreatment of 17*).

Organization of Materials

This scales measures orderliness of work, play and storage space.. Children who have difficulties in this area often cannot function efficiently in school or at home because they do not have their belongings readily available for their use.

The participants who experienced the P.A.C.E program shows a decrease in the level of deficit but not significant (*Baseline of 6.8 and Posttreatment of 6.6*). While the group who just continued the usual academic program, did not show significant change (*Baseline of 15.1 and Posttreatment of 14.0*).

	CONTROL GROUP		EXPERIMENTAL GROUP	
	<i>f</i>	%	<i>f</i>	%
Age				
5-7	3	30%	2	20%
8-10	3	30%	2	20%
11-13	4	40%	6	60%
Total	10	100%	10	100%
Socio Economic	<i>f</i>	%	<i>f</i>	%
Class D/ Monthly Income of ~Php 16000	6	60%	4	40%
Class E/Monthly Income of ~Php 6000	4	40%	6	60%

TABLE 1. PARTICIPANTS CHARACTERISTICS (N=20)

	P.A.C.E.		CONTROL	
	Baseline	Posttreatment	Baseline	Posttreatment
Shift	13.6 (1.65)	12.4 (2.07)	15.3 (4.16)	15.2 (4.13)
Working Memory	18.2 (1.55)	15.2 (2.20)	17.9 (5.23)	16.8 (5.67)
Inhibit	18.5 (2.51)	16.7 (3.13)	18.6 (4.55)	18.3 (5.17)
Emotional Control	21.3 (1.83)	20.2 (2.35)	21.4 (1.71)	22.1 (2.56)
Initiate	13.8 (1.23)	13.5 (2.12)	17.1 (4.53)	17 (4.71)
Plan/Organize	27.1 (3.41)	24.5 (3.50)	22.7 (7.00)	22.4 (7.17)
Organization of materials	6.8 (2.25)	6.6 (2.50)	9.4 (3.50)	10.1 (3.93)
Monitor	14.7 (2.11)	12.9 (1.79)	15.1 (4.20)	14.0 (4.37)

TABLE 2. MEAN (SDs) FOR P.A.C.E. PROGRAM AND CONTROL GROUP

Discussion

The aim of this study is to test the efficacy of the Psychoeducation and Cognitive Exercises Program (P.A.C.E.) which was facilitated for 12 straight weeks to children with A.D.H.D. This study compared the levels of executive functions deficits, utilising the BRIEF as the instrument, before and after the program. The control group continued the academic program offered in the school they were enrolled in. Both groups had the highest level of deficit in Plan/Organize and slight deficit in the domain of the organization of materials. The results demonstrated that the deficits in the executive functions of the children in the experimental group significantly decreased in the five out of eight domains of BRIEF.

Consistent with literature, facilitating a behavioural intervention to children with ADHD shows promising effects to the participants. DuPaul & Stoner in 2003 (as cited by Gawrilow, Gollwitzer & Oettingen, 2011) reported that interventions improving the executive functions in children with ADHD are essential for the treatment of ADHD in childhood. In 2006, a review by Chronis et al concludes that the existing literature clearly supports the use of behavioural interventions in the treatment of childhood ADHD, both alone and in combination with stimulant treatment. While in 2009, a meta-analysis reviewed 174 studies of behavioural treatment in children with ADHD which yielded that across all designs, results consistently showed a large effect size for behavioural treatment for ADHD.

Cognitive Behavioral Therapy (CBT) in general uses the principles of rewards and consequences to shape target behaviour. (Ewans, Schultz and Sadler, 2008). Psychoeducation is one variation of CBT wherein the client together with the therapist would be able to discuss related topics of the condition or issue with the hope of understanding the situation and be able to become better individual. In this study, the participants even in the young age were educated on what their condition is all about. Myths such as having the condition may mean being crazy and useless was discussed and facts about ADHD were given. Information on what it is all about, how different or the same they are with the other children and the things they are able to do are just some of the things discussed. It was discussed in the simplest manner such as explaining using situations they commonly encounter and utilised pictures to be able to further illustrate the information.

The mounting number of commercial claims that computer-based cognitive training will provide significant and lasting improvement in attention, impulse control, social functioning, academic performance, and complex reasoning skills for children with ADHD could not have arrived at a better time—if these claims are veridical (Rapport, et. al, 2013). In this study, the cognitive exercises were varied using computer and actual educational toys (e.g. memory game, tan gram, puzzles, etc). The participants were initially observed as hesitant to try the different exercises hence when they seem to get hold of the mechanics, they were sometimes resistant to start new activities. The activities from one session would be repeated to the succeeding sessions depending on the pace of the participants.

P.A.C.E. utilised simple activities (e.g. building towers, completing puzzles etc) in order for these to be easily facilitated in the comforts of the home thus addressing the financial constraints of the families of the participants. The program shows significant improvements in majority of the domains of the executive functions for those who participated. Hence, when they were compared with those in the control group, significant differences were not noted. However, the post treatment scores reveal numerically that there are differences. Executive functions can be considered as the main term of the different mental processes since the purpose of one area overlaps another.

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