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2006

The Effects of a Brain Development-Based Maternal Training Package (BDBMTP) on Parenting Techniques and Preschool Child Development

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Originally published in the Proceedings of the EDU-COM 2006 International Conference. Engagement and Empowerment: New Opportunities for Growth in Higher Education, Edith Cowan University, Perth Western Australia, 22-24 November 2006.
This Conference Proceeding is posted at Research Online.
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Tunsiri, A. The Effects of a Brain Development-Based Maternal Training Package (BDB-MTP) on Parenting Techniques and Preschool Child Development

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ABSTRACT

Background: The early years of life are crucial in shaping long term outcomes for children. The research consistently demonstrates that families have the greatest impact on the young. In this research traditional parenting is compared with parenting skills developed with an understanding of recent neurobiological research and its understanding of child development. These new parenting skills are taught through the training programme named BDB-MTP (Brain Development-based Maternal Training Package). Methods: The subjects consisted of 78 mothers and their 78 preschool children, divided into 2 equal groups. A non-equivalent control group design was used. A range of measures were taken before the commencement of the programme, on completion, and at follow-up 5 months later. For the parents, these measures included a parent questionnaire and the Parent Stress Index for the children, the Preschool Readiness Inventory and Vineland Adaptive Behaviour Scales were used. The data were analysed using MANCOVA and multiple regressions.

Result: The findings revealed that the BDB-MTP yielded better results than the TPT (Traditional Parenting Technique) in various areas. As a whole, on average, the stress of the mothers in the former group is significantly less than those in the latter group in the posttest and their stress levels are insignificantly different in the follow-up study. The stress levels of the mothers in both groups were significantly different in 4 aspects in the posttest and 2 aspects in the follow-up study. The effect sizes of the trainings on the 2 aspects were moderate. Mother education had a significant effect on parenting techniques and child development in both groups, and most mothers in the experimental group agree that the BDB-MTP package was beneficial for them, and that further training should be provided. Conclusion: How can family best be supported when offering effective rearing experiences for their children? How can findings from the study in parent education, especially those relating to preschool child development best be used?

INTRODUCTION

It is widely accepted nowadays that preschool child development (or the first 3 years of children's lives) is critical, because it is during this time that children develop their abilities to think, speak, learn, reason, while arranging the foundation of their future values and social behaviour as adults. It is also during this period that children's brain cells proliferate exponentially, as brain pathways are established and reinforced (UNICEF 2001). Experiences in the world around them impact on children's brain development, and shape the adult outcomes. It is during this period that all children require good parental care, thus parent education, is very important.

Internationally, parents are encouraged to become involved in their children's early learning because their involvement has three main benefits. Firstly, it helps the children's development by increasing the parents' understanding of appropriate educational practices either in the home or in child care centres. Second it enhances national education development by improving children's ultimate education outcomes. Third, it benefits business development by enhancing literacy, creating a more literate and more productive workforce (Cairney 1997,Cone 1993, Gelfer 1991,Hannon 1995). Parent education is one strategy for making the job of parenting more effective. In every nation, parenting is the most important job in creating a successful future. An "ecological" view of parent education supports a programme based on the theme that, while families have the most significant influence on children's development, other institutions also affect both family and child (Bronfenbrenner 1974, Kagan 1987). Parent education today is often

incorporated into a broader approach to strengthen families within their ecological context. This is considered a central component of an integrated approach to family support (Kagan, 1987).

Around the world a number of successful parent education programmes have become very well known and serve as models for further development. Even though different parent education projects may employ different methods in helping parents and children, each recognizes (explicitly or implicitly) the importance of child brain development in the early stage of life when brain wiring is occurring at a rapid pace and emotional development is beginning. From birth, children quickly develop their skills in experiencing and expressing different feelings, as well as their ability to cope with and manage many different kinds of emotions (Thompson 1994). What happens during the early stages of a child's development will have major consequences throughout the course of his or her lifetime. Better Beginnings, Better Futures Project (Perters & Russell, 1996): A Canadian parent education project, which the following main goals: (1) to prevent serious social, emotional, behavioural, physical, and cognitive problems in young children, (2) to promote the social, emotional, behavioural, physical, and cognitive well being in young children; and (3) to enhance the abilities of children who come from socio-economically disadvantaged families and communities.

Triple P– Positive Parenting Program: A very popular parent education programme, in Australia (Sanders, 1999). It aims mainly at preventing behavioural, emotional and developmental problems in children (age 0-12 yrs.) by enhancing the knowledge, skills, and confidence of their parents. These parents are assisted in three specific areas: children's development, social competence, and self-control. The project consists of four group sessions which provide opportunities for parents to learn through observation, discussion, practice and feedback.

Even though different parent education projects may employ different methods in helping parents and children, each recognizes (explicitly or implicitly) the importance of child brain development in the early stage of life when brain wiring is occurring at a rapid pace and emotional development is beginning. From birth, children quickly develop their skills in experiencing and expressing different feelings, as well as their ability to cope with and manage many different kinds of emotions (Saarni, Mumme, & Campos, 1998; Thompson, 1994). What happens during the early stages of a child's development will have major consequences throughout the course of his or her lifetime.

A major principle for intellectual development is the promise that every child is born with intelligence. It is therefore important to lay a good foundation for children, so that they can learn and fully develop their intellectual abilities. Research on brain development has focused on the child's environment as enormously impacting the ways neural pathways of the brain will be arranged (Newberger 1997). In Thailand the mentioned aspect is still new and it needs to be explored more in details, especially for preschool children. Therefore, working in a Rajabhat university and realizing that parent education, brain development and preschool child development are important, the researcher proposed to conduct a research study on "The Effects of a Brain Development-based Maternal Training Package (BDB-MTP) on Parenting Techniques and Preschool Child Development"

OBJECTIVES OF THE STUDY

The main objectives of this study are:

1. To compare the effects of 2 child rearing methods named BDB-MTP (Brain Development-Based Maternal Training Package) and TPT (Traditional Parenting Technique) on child rearing knowledge, child rearing practice and child development,
2. To compare the stress levels of the mothers in both groups in different periods of time,
3. To investigate the effects of some socio-economic factors on their parenting techniques, parenting stress and child development and
4. To survey the opinions of the mothers using the training package.

RESEARCH PROCEDURE

Population and Subjects

The population of the study was 250 mothers who have their preschool children in 5 classrooms. All children were attending the Watpitulatilardrungsarid Kindergarten, Chachoengsao Province. Since this is only a case study, the subjects were 78 mothers and their 78 preschool children. They were purposively selected from a larger group of volunteers. The selection of mothers was based on 4 socio-economic factors, age, education level, monthly family income and number of children: they were divided into 2 approximately equal groups of 39 mothers and consequently 39 children and then randomly assigned as control and experimental groups. A nonequivalent control group design was used. The mothers in the control group were to be treated by TPT (Traditional Parenting Technique) whereas BDB-MTP (Brain Development-Based Maternal Training Package) was used on the experiment group.

Research Instruments

There were 5 main instruments used in the study, (1) BDB-MTP package, (2) Questionnaires on Parenting Technique, (3) Vineland Adaptive Behaviour Scales, (4) Preschool Readiness Inventory and (5) Parent Stress Index. The first instrument was constructed and validated by the researcher. The training package consisted of 6 booklets, each for different purposes. Its Item-Objective Congruence Index is 0.85 and Cronbach's alpha is 0.88. They were written using brain-based theories and principles to provide both theoretical knowledge and practical activities on how to rear 3-6-year old children. These booklets were of pocket size (containing only a few pages) enabling mothers to study in a limited amount of time. Each booklet was composed of: 1.) Information on brain development; 2.) Parent-child activities; and 3.) A record of child activities. The six booklets were numbered and named as follows: 1. Establishing a Warm Relationship: 2. Developing the Children's Brain: 3. Factors Contributing to "Human Brain Development": 4. Child Rearing Techniques and Child Development: 5. Rearing Techniques and Self Confidence: and 6. Rearing Techniques in Creating Happiness for Children.

The questionnaires on parenting techniques were developed by Tantanee (1990). They are self-administered. Their construct validity indices ranged from 0.21 to 0.73 while their Cronbach's alpha reliability index was 0.90. The Vineland Adaptive Behavior Scales (Survey Form) covers 5 domains, namely (1) Communicative Skills, (2) Daily Living Skills, (3) Socialization Skills, (4) Motor Skills, and (5) Maladaptive Behaviour and was previously used by a Thai researcher successfully (Onnark 1998). The test-retest reliability of 0.74 for the composite form has been found. The former was originally written in Thai whereas the latter had already been translated into Thai and tried out in Thai context by the author. The Preschool Readiness Inventory was developed by Phisalaphong and Others (1983) to use in Thai context. A split-half reliability of 0.88 was found. The Parenting Stress Index is composed of 101 rating scales and was constructed by Abidin (1995). It covers 3 major domains of stressors, namely (1) Child Character, (2) Parent Character, and (3) Situational/demographic Life Stress. An original reliability is 0.95. The researcher had permission from its author to translate it into Thai and then back translate it (PAR, 2003) before administering the Thai version to 44 Thai mothers. A Cronbach's alpha reliabilty of 0.94 was found.

Basic Assumptions

In conducting this research study, the researcher started with the following basic assumptions:

1. The Thai mothers who use BDB-MTP and TPT initially have no significant differences in separate aspects of their parenting techniques e.g. RP (Child Rearing Practice) and RK (Child Rearing Knowledge).
2. The Thai children whose mothers use BDB-MTP and TPT initially have no significant differences initially in separate aspects of the study, e.g. communicative skills, daily living skills, social skills, moral skills and cognitive and readiness.

Experimentation and Data Collection

Before giving any treatment

1. The Preschool Readiness Inventory and the Vineland Adaptive Behavior Scales were used to evaluate the children's development in both groups before their mothers receive any instruction.
2. The questionnaires on parenting techniques and Parent Stress Index were used to evaluate the mothers' parenting techniques in both groups.

During the experimentation
Experimental Group
1. The mothers were invited to a meeting to inform them about the objectives, steps and procedures of the study.
2. The first 3 training booklets were distributed to the mothers and they were asked to use them at home with their children in series starting from booklet 1. They were also asked to use one booklet for a week. Each booklet was composed of: Information on brain development: Parent-child activities: And A record of child activities.
3. A second meeting was held with all the mothers in the fourth week to gather feedback about the training package and discuss any other issues arising from the research or the participants. The training booklets (4-6) were distributed to the mothers and they were asked to use them with their children at home.
4. A third meeting was held with all mothers in the last week to gather feedback about the training package and they were asked to write recommendations pertaining to any aspects of the training.

After the experimentation
Experimental and Control Groups
1. The Preschool Readiness Inventory and the Vineland Adaptive Behaviour Scales were used to evaluate the children's development.
2. The questionnaires on parenting techniques and the Parent Stress Index were used to evaluate the mothers' parenting techniques.
3. The Preschool Readiness Inventory and the Vineland Adaptive Behaviour Scales were used in the follow-up study of the children's development approximately 5 months after the completion of the experiment.

DATA ANALYSIS

The collected data were to be analysed by SPSS/PC 14.00 (Statistical Package for the Social Sciences for Personal Computer, Version 14.00) using descriptive statistics, multiple regression and MANCOVA. Since there are many aspects of the study, only part of the first 2 hypotheses are presented.

H1: The Thai mothers who use BDB-MTP have better developed parenting techniques than those who use TPT in RP (Child Rearing Practice) and RK (Child Rearing Knowledge) as measured in the posttest and follow-up study.
H1.1 Thai mothers who use BDB-MTP have better developed parenting techniques than those who use TPT, as measured in the 2 aspect of the posttests: RP (Child Rearing Practice) and RK (Child Rearing Knowledge).

Table 1: The Basic Descriptive Statistics of Thai mothers who use BDB-MTP and those who use TPT (n1 = 39, n2 = 39) as measured in their Posttest and Follow-up Study.

		Posttest		Follow-up Study	
Dimensions	Groups	Means	S.D.	Means	S.D.
RP physical rearing	Control	57.85	7.010	58.13	6.760
	Experiment	60.82	5.749	61.33	5.621
RP social rearing	Control	61.23	7.955	62.51	7.532
	Experiment	65.54	7.691	65.92	7.589
RP intelligent rearing	Control	55.69	6.105	56.10	6.324
	Experiment	57.62	4.993	58.05	4.812
RP moral rearing	Control	59.54	6.328	59.90	6.664
	Experiment	62.33	5.352	63.13	5.069
RK physical rearing	Control	6.64	1.181	7.00	1.051
	Experiment	7.72	1.538	7.74	1.352
RK social rearing	Control	6.69	1.055	6.87	1.031
	Experiment	8.10	1.071	7.90	1.021
RK intelligent rearing	Control	6.95	1.050	7.23	1.012
	Experiment	8.21	1.005	8.08	.900
RK moral rearing	Control	7.18	1.189	7.38	.877
	Experiment	9.03	.932	8.69	.922

Table 1 shows 2 main aspects in child rearing techniques. One is Child Rearing Practice (RP) and the other is Child Rearing Knowledge (RK). Each aspect consists of 4 dimensions. This table reveals means and standard deviations of the mothers in both groups covering all 8 dimensions before they are statistically compared in Tables 2 and 3.

Table 2: The Differences between the Parenting Techniques of the Thai Mothers who Use BDB-MTP and those who Use TPT as measured in the Posttests in 2 aspects: RP (Child Rearing Practice) and RK (Child Rearing Knowledge) (n1 = 39, n2 = 39)

Dependent Variable		Sum of Squares	df	Mean Square	F	ηp2	Observed Power
RP physical rearing	Contrast	39.699	1	39.699	.956	.013	.162
	Error	2989.311	72	41.518			
RP social rearing	Contrast	212.367	1	212.367	3.322	.044	.436
	Error	4603.156	72	63.933			
RP intelligent rearing	Contrast	31.566	1	31.566	.999	.014	.167
	Error	2274.881	72	31.596			
RP moral rearing	Contrast	65.819	1	65.819	1.845	.025	.268
	Error	2568.161	72	35.669			
RK physical rearing	Contrast	16.054	1	16.054	8.241*	.103	.808
	Error	140.259	72	1.948			
RK social rearing	Contrast	29.748	1	29.748	27.843*	.279	.999
	Error	76.927	72	1.068			
RK intelligent rearing	Contrast	20.328	1	20.328	19.157*	.210	.991
	Error	76.404	72	1.061			

RK moral rearing	Contrast	49.030	1	49.030	41.167*	.364	1.000
	Error	85.753	72	1.191			

* p<0.05

Table 2 shows the figures from MANCOVA when 4 unequal variables in the pretests were covariate (statistically controlled). They were the number of children in the family: the mood of the children; the children's communication skills; and their motor skills. The table shows clearly that out of 8 dimensions (factors) there were 4 significant differences between the parenting techniques in both groups with respect to their knowledge in physical rearing; knowledge in social rearing; knowledge in intelligence rearing; and knowledge in moral rearing as measured in their posttests [F (1, 72) = 8.241, 27.843, 19.157 and 41.167, p <0.05 respectively]. The rest (namely the practical physical rearing, the practical social rearing, the practical intelligence rearing and the practical moral rearing) in both groups were not significantly different. Based on the findings in Table 1, Thai mothers who used BDB-MTP had more knowledge in child rearing techniques than those who use TPT in the second aspect mentioned above (RK or Child Rearing Knowledge). However, their practical rearing techniques in the first aspect (RP or Child Rearing Practice) were not significantly different. Therefore, part of the first hypothesis was accepted.

In addition, it was found that the effect sizes (ŋp2) of the treatments (methods of training) of the mothers in both groups in Child Rearing Practice (the first 4 dimensions) range from 0.013 to 0.044, while those in Child Rearing Knowledge range from 0.103 to 0.364. This means that the methods of training had small effects on the mothers' child rearing practice but they had moderate effects on their child rearing knowledge (Hopkins 2002:3). They can only account for approximately 1% to 4% of the total effects plus error variance of the first 4 dimensions and approximately 10% to 36% of the second 4 dimensions (Becker 1999:4). Moreover, the observed powers of the experimentation on Child Rearing Practice range between 0.162 and 0.436 which, generally speaking, are rather low, but those of the Child Rearing Knowledge range from 0.801 to 1.00 which are very high. This indicated that if the experimentation were to be replicated 100 times, the null hypotheses would correctly be rejected at p = 0.05 on 16.20% to 43.60% of those replications on the Child Rearing Practice while 80.10% to 100% would be true in the case of the Child Rearing Knowledge (Mordkoff, 2002:4; Becker, 1999:4). In other words, the indexes show that the findings of the study may not be consistent or reliable for the study on the first aspect but very reliable for the second aspect.

H 1.2: The Thai mothers who use BDB-MTP have more effective parenting techniques than those who use TPT in 2 aspects: RP and RK as measured in the follow-up study.

Table 3: The Differences between the Parenting Techniques of the Thai Mothers who Use BDB-MTP and those who Use TPT in the follow-up study in 2 aspects: RP (Child Rearing Practice) and RK (Child Rearing Knowledge) (n1 = 39, n2 = 39)

Dependent Variable		Sum of Squares	df	Mean Square	F	Ŋp2	Observed Power
RP physical rearing	Contrast	59.388	1	59.388	1.519	.021	.229
	Error	2814.686	72	39.093			
RP social rearing	Contrast	102.832	1	102.832	1.722	.023	.253
	Error	4300.488	72	59.729			
RP intelligent rearing	Contrast	23.338	1	23.338	.726	.010	.134
	Error	2313.991	72	32.139			
RP moral rearing	Contrast	104.933	1	104.933	2.867	.038	.386
	Error	2634.794	72	36.594			

RK physical rearing	Contrast	7.051	1	7.051	4.674*	.061	.569
	Error	108.618	72	1.509			
RK social rearing	Contrast	12.476	1	12.476	11.701*	.140	.921
	Error	76.766	72	1.066			
RK intelligent rearing	Contrast	8.775	1	8.775	9.436*	.116	.858
	Error	66.955	72	.930			
RK moral rearing	Contrast	28.988	1	28.988	34.894*	.326	1.000
	Error	59.813	72	.831			

* $p<0.05$

Table 3 shows the figures from MANCOVA when 4 unequal variables in the pretests were covariate (statistically controlled): the number of children in the family; the mood of the children; the children's communication skills; and their motor skills. The table shows clearly that out of 8 dimensions (factors) there are 4 significant differences between the parenting techniques in both groups with respect to their knowledge in physical rearing, knowledge in social rearing, knowledge in intelligence rearing and knowledge in moral rearing, as measured in their follow-up study [$F(1, 72) = 4.674$, 11.701, 9.436 and 34.894, $p <0.05$ respectively]. The rest (namely the practical physical rearing, the practical social rearing, the practical intelligence rearing, and the practical moral rearing) in both groups were not significantly different. Based on the findings in Table 2, it reveals that the Thai mothers who use BDB-MTP had greater knowledge in child rearing techniques than those who used TPT, as pertaining to the second aspect mentioned above (RK or Child Rearing Knowledge). However, their practical rearing techniques in the first aspects (RP or Child Rearing Practice) were not significantly different. Therefore, part of hypothesis H 1.2 was accepted.

To summarize, when taking the findings from Hypotheses 1.1 and 1.2 into consideration, it can be concluded that The Thai mothers who used BDB-MTP had greater knowledge in child rearing (KR) than those who used TPT, as measured in both their posttests and the follow-up study, but practical rearing techniques were not different. In other words, part of hypothesis H1 was accepted.

In addition, it was found that the effect sizes ($\eta p2$) of the treatments (methods of training) on the mothers in both groups in Child Rearing Practice (the first 4 dimensions) ranged from 0.010 to 0.038 while those in Child Rearing Knowledge ranged from 0.061 to 0.326. Generally speaking, this means that the methods of training had small effects on the mothers' child rearing practice and child rearing knowledge, as measured in the follow-up study. Moreover, the observed powers of the experimentation on Child Rearing Practice ranged between 0.134 and 0.386 which, generally speaking, are rather low, but those of the Child Rearing Knowledge ranged from 0.569 to 1.00 which were very high.

H2.: The Thai children whose mothers use BDB-MTP have improved development in comparison with those children whose mothers use TPT.
H2.1:The Thai children whose mothers use BDB-MTP have improved development in comparison with those whose mothers use TPT in the posttests in 5 different aspects, namely, communicative, daily living, social, moral skills and Cognitive.

Table 4: The Basic Descriptive Statistics of the Child Development Factors of the Children whose Mothers Use BDB-MTP and TPT (n1 = 39, n2 = 39) in their Posttest and Follow-up Study

		Posttest		Follow-up Study	
Dimensions	Groups	Means	S.D.	Means	S.D.
Communicative skills	control	54.18	2.553	64.90	2.945
	experiment	57.31	2.284	68.74	3.282
Daily living skills	control	69.33	2.004	73.49	2.752
	experiment	69.23	2.528	75.74	2.998
Social skills	control	50.33	2.399	55.26	1.983
	experiment	50.90	1.889	57.95	2.481

Motor skills	control	40.10	3.858	44.31	3.968
	experiment	42.36	4.671	48.44	5.009
Cognitive	control	43.69	6.237	49.77	5.617
	experiment	43.21	7.971	50.26	7.044

Table 4 shows basic descriptive statistics, namely means and standard deviations of the 5 child development factors (dimensions) whose mothers use BDB-MTP and TPT . To test the differences of the means of each pair simultaneously, two MANCOVAs were applied and the results are shown in Tables 5 and 6 below.

Table 5: The Differences between the Child Development Factors of the Children whose Mothers Use BDB-MTP and TPT. (n1 = 39, n2 = 39) in their Posttests

Dependent Variable		Sum of Squares	df	Mean Square	F	Ƞp2	Observed Power
Comm. skills	Contrast	39.363	1	39.363	26.226*	.267	.999
	Error	108.067	72	1.501			
Daily living skills	Contrast	3.478	1	3.478	.680	.009	.129
	Error	368.448	72	5.117			
Social skills	Contrast	.335	1	.335	.078	.001	.059
	Error	308.682	72	4.287			
Motor skills	Contrast	6.069	1	6.069	3.192*	.042	.422
	Error	136.891	72	1.901			
Cognitive	Contrast	110.845	1	110.845	2.311	.031	.323
	Error	3453.732	72	47.969			

* $p<0.05$

Table 5 shows the figures from MANCOVA when 4 unequal variables in the pretests were covariate (statistically controlled). They were the number of children in the family, the mood of the children, the children's communication skills and their motor skills. The table shows clearly that out of 5 factors there were 2 significant differences between the children in both groups in the aspects of their communication skills and motor skills in their posttests [$F(1, 72) = 26.226$ and $F(1, 72) = 3.192$, $p < 0.05$ respectively]. The rest, namely children's daily living skills, their social skills and their cognitive skills, of both groups were not significantly different. Based on the findings in Tables 4 and 5, it is revealed that the Thai children whose mothers used BDB-MTP had more communication skills and motor skills than the ones whose mothers used TPT. Therefore, part of hypothesis 2.1 is accepted.

H2.2: The Thai children whose mothers use BDB-MTP have improved development than those whose mothers use TPT in the follow-up study in 5 different aspects, namely, communicative skills, daily living skills, social skills, motor skills and Cognitive.

Table 6: The Differences between the Child Development Factors of the Children whose Mothers Use BDB-MTP and TPT. (n1 = 39, n2 = 39) in their Follow-up Study

Dependent Variable		Sum of Squares	df	Mean Square	F	ηp2	Observed Power
Comm. skills	Contrast	108.501	1	108.501	11.816*	.141	.924
	Error	661.140	72	9.182			
Daily living skills	Contrast	30.181	1	30.181	3.838*	.051	.489
	Error	566.168	72	7.863			
Social skills	Contrast	40.740	1	40.740	9.369*	.115	.855
	Error	313.086	72	4.348			
Motor skills	Contrast	24.863	1	24.863	4.997*	.065	.597
	Error	358.212	72	4.975			
Cognitive	Contrast	10.800	1	10.800	.263	.004	.080
	Error	2955.006	72	41.042			

* $p<0.05$

Table 6 shows the figures from MANCOVA when 4 unequal variables in the pretests were covariate (statistically controlled). As mentioned earlier, they were the number of children in the family, the mood of the children, the children's communication skills and their motor skills. The table shows clearly that out of 5 factors there were 4 significant differences between the children in both groups in the aspects of their communication skills, daily living skills, social skills and motor skills in their follow-up study [$F(1, 72) = 11.816$, $F(1, 72) = 3.838$, $F(1, 72) = 9.369$ and $F(1, 72) = 4.997$, $p < 0.05$ respectively]. Only cognitive of the children in both groups was not significantly different. Based on the findings in Tables 4 and 6, it's revealed that the Thai children whose mothers used BDB-MTP had more communication skills, daily living skills, social skills and motor skills in their follow-up study than those whose mother used TPT. Therefore, part of hypothesis 2.2 is accepted.

Now, when taking the findings from Hypotheses 2.1 and 2.2 into consideration, it can be concluded that the Thai children whose mothers used BDB-MTP had more development skills than those whose mothers use TPT since 6 out of 10 skills of the former were significantly higher than those of the latter. In other words, part of hypothesis 2 is accepted.

FINDINGS

Since there are many aspects of the study as mentioned above and only the findings of the first 2 objectives can be presented, all findings; however, can be summarized as follows:

1 The Thai mothers who use BDB-MTP had better developed parenting techniques than those who use TPT only in Child Rearing Knowledge (RK) in both post test and follow-up study. The effect sizes of the training on Child Rearing Practice (RP) are small but on Child Rearing Knowledge (RK) are moderate.

2. The Thai children whose mother use BDB-MTP had more advanced scores on the child development scale than those children whose mother used TPT. This development refers to progress in the areas of cognitive and readiness skills, communicative skills, daily living skills, social skills, motor skills and adaptive skills. Out of 5 factors, in the posttest there were significant differences in communicative skills and motor skills. During follow up stage significant differences between the control and the experimental groups were maintained in social skills and daily living skills.

3. On average, as a whole, the mothers who used BDB-MTP package had significantly less stress than those who used TPT. However, in the posttest, the mothers in the former group had

significantly more stress than those in the latter group with regards to Distractibility, Adaptability and Competence, but had less stress in Mood. In the follow-up study the mothers in the former group had significantly more stress than those in the latter groups with regards to Competence but had less stress in Mood.

4. Mother education had a significant effect on parenting techniques and child development in both groups.

5. Most mothers in the experimental group agreed that the BDB-MTP package was beneficial to them, and that further training should be provided.

DISCUSSION

Based on the findings mentioned above from the tables, there are some interesting points worth discussion, but only three of them can be presented below:

Why do the training methods have small effect sizes on the mothers' child rearing practice, (and do not make their rearing practice aspects significantly different) but have moderate effects on their child rearing knowledge (and make their rearing knowledge aspects significantly different)? The phenomena could be due to the following reasons:

1 The 6-week training on how to use the Brain Development-based Maternal Training Package (BDB-MTP) is too short for the mothers in the experimental group to digest and make use of what they learn in real practice.

2 The mother education could be one of the causes because, as mentioned earlier, it was found that it has a significant effect on parenting techniques and child development in both groups. Based on the background of the mothers in both groups, their education levels are very similar and majority of them got their first degrees.

3 "Knowing is easier to learn than implementing what is learned." This fact could be referred from Bloom's taxonomy of cognitive learning (Bloom et al. 1984) and could be applied in this case, especially when the mothers in the experimental group might not have enough time to try something new and different from what they had already know about child rearing.

Generally speaking, why does the BDB-MTP training give a better result to the mothers than the TPT training? The phenomena could be due to the following reasons:

Group discussions during the meetings provided by the researcher in the BDB-MTP training could be a useful means for the mothers to have a chance to exchange their ideas on how to rear their children appropriately. Besides, the mentioned activities could stimulate the mothers to have high motivation and awareness on how to rear their children more than usual while such activities are not available in the TPT training.

The training package provided by the researcher for all the mothers in the BDB-MTP training group could be a useful manual for them on how to rear their children appropriately, especially on brain-based child development. This can be confirmed by the last finding mentioned above. On the contrary, the mothers in the TPT group do not have such a manual. They may have to rely on their own knowledge and experience on how to rear their children. Their ways of child rearing may or may not relate directly to brain-based child development.

Why did the mothers in the BDB-MTP group have more stress than those in the TPT group with regards to Distractibility, Adaptability and Competence in the posttest? The phenomena could be due to the following reasons:

Based on the findings, the mothers in the BDB-MTP group have more knowledge significantly than those in the TPT group. Possibly, the more they knew, the more they had stress in the 3 mentioned aspects because they may have worried about how to rear their children appropriately and accordingly to a number of set guidelines suggested by the researcher (Nenours, 2006). However, naturally, the mothers in the TPT group would feel less stress in the mentioned aspects since they may not have had to worry much about how to rear their children according to any set guidelines. They may take things easier and thus have less stress

However, since on average the moods of the children in the posttest in the BDB-MTP group were significantly less than those in the TPT group, this consequently, could be a main factor making the stress of the mothers as a whole in the former group significantly less than those in the latter group in the posttest.

Recommendation for research consumers

How can we make use of the findings from the study in parent education, especially for preschool child development? The researcher thinks that here are what should be done

The training course on how to use the Brain Development-based Maternal Training Package (BDB-MTP) should be continuously longer than 6 weeks and very intensive. It should emphasize more on hand-on experience than giving child rearing knowledge. Besides, some visual media like VDOs and CDs should be used in the training and provided to the mothers to learn by themselves at home.

Kindergarten schools should have an orientation session on how to use the Brain Development-based Maternal Training Package (BDB-MTP) at the beginning of every school year when the mothers first take their children to schools. Normally, it is the time that the mothers are very active and eager to learn new things about their child development. Consequently, they can learn the matter more. Later on, the schools may have different follow-up activities with the mothers such as meetings, idea-sharing sessions, home-calls, questions and answers and questionnaires.

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