

The Effects of Sandplay Therapy on the Stress and Stress-related EEG Values of Parents of Children Who Visited Counseling Institutes

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<Abstract>

In the present study, sandplay therapy was implemented to reduce the stress of parents of children who visited counseling institutes and the effects of the sandplay therapy were analyzed. The study subjects were the parents of children who visited a child counseling center located in the Chungnam region and sandplay therapy was implemented on them once per week for ten weeks. To examine changes in the children's parents' stress, symptoms of stress (SOS) tests were conducted before and after the intervention and the results were compared and analyzed. As scientific measurement, the changes in brainwaves under stress were measured biweekly before (six times) and after (six times) the session using a brainwave measurement system (EEG-4). According to the results of the study, first, sandplay therapy was effective in reducing stress based on the experimental group's Sos. Second, stress-related brainwave values were reduced after the intervention compared to the values before the intervention. These results indicate that sandplay therapy was effective in reducing the stress of parents of children who visited counseling institutes.

Keywords : Sandplay Therapy, Brainwave, Stress, Child Counseling Institute, Parents

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I . Introduction

1. Necessity and purpose of the study

Stress is felt and experienced by everybody in the course of their lives. If a person perceives an external event negatively and selects inappropriate resources to deal with the perceived stress thereby experiencing stress, they will show the state of maladjustment in their daily life (Oh, 2008).

Marriages and childbirth are factors that make males and females experience qualitative satisfaction with family life while simultaneously expanding the functions of family members. Childbirth brings about major changes to family life and is perceived as a positive event in most cases. However, the resultant reduction in individuals' time together, increases in expenditures, and physical fatigue due to childrearing may act as factors for tension and stress, and this stress appears more seriously in mothers who generally rear children than in fathers (Kang, 2002).

If individual parents have psychological difficulties, their children will be affected. Therefore, the role of mothers is very important in childrearing and mothers' mental health greatly affects family members. If mothers accumulate personal stress, it will affect their childrearing and the children will suffer rearing stress, which will cause them psychological instability that may induce problematic behavior. The characteristics of parents' personalities also directly affect their children. Among them, parents' psychological difficulties such as stress, anxiety, and depression may have negative effects on children (Oh, 2008).

It is known that parents of children with disabilities experience 2-3 times higher stress than parents of children without disabilities (Bae & Song, 1986). Many psychological changes occur in parents of children with disabilities and many study results indicate that these changes have negative effects rather than positive effects. When disabilities appeared in children, their parents become to experience great pain and shocks. Thereafter, while accepting and adapting to their children's disabilities, the parents may experience psychological difficulties such as frustration, shame, and anxiety and become stressed due to emotional problems such as a feeling of burden of childrearing and anxiety about the future (Dyson, 1993).

Children's behavioral problems include ADHD, lack of peer relationships and sociality, anger explosion, irritation and nervousness, shyness or shrinking, emotional instability, tic disorders, separation anxiety, feeding problems, and selective mutism. Children with conduct disorders show characteristics such as aggressive behaviour, kleptomania, defiance, lies, and Internet addiction as well as school underachievement, learning disabilities, school refusal, or poor learning attitudes due to maladjustment to school life. These problems may cause severe stress to parents who take care of children with such problems. In particular, mothers of children who show aggressiveness among children's behavioral problems may form negative self-images and low self-regard and experience negative emotions such as depression-anxiety, fatigue, anger, and a sense of isolation. Parents of children with ADHD experience lethargy and depression due to their children's behavioral problems (Kang, Jang, Kim & Kim, 2011).

Another study reported that these parents not only showed high levels of self-anxiety and lost confidence in their ability to perform the roles of parents but also tended to perceive that they were wrongly rearing their children (Harman & Brim, 1990). Actually, these parents respond sensitively to the views of surrounding people about their children's attending counseling institutes in many cases and feel emotional pressure and a sense of guilt wondering whether their children show problematic behavior because of their faults (Kim, 2009; Bratton & Landreth, 2006). That is, although they visited counseling institutes to receive help for their children, they were under severe stress due to a feeling of burden and frustration in relation to the fact that they should receive experts' help and visit counseling institutes (Ahn, 2001). If parents' emotional difficulties and stress are aggravated due to their children with behavioral problems, it may again affect the children's psychological development, and therefore studies on therapeutic approaches to this issue are necessary.

Since sandplay therapy induces clients to express their inner worlds using not only languages but also symbols in sand boxes, it is widely used by many people ranging from infants who cannot use languages, infants with symptoms that cannot be easily diagnosed, repressed children, children with developmental disorders, and young children who have difficulties in expressing internal things to adults. In addition, sandplay therapy is a non-directive and unstructured treatment method that relieves negative emotions by providing free but protected safe spaces and cures internal trauma, since clients express their inner worlds

using sand boxes and symbols in confidential relationships with therapists (Park, 2008). Sandplay therapy is based on the premise that humans have the power to heal themselves deep in their unconsciousness and this power to heal will begin to act if the appropriate conditions are provided. Therefore, sandplay therapy can reduce the defensiveness of parents of children who visit counseling institutes and induce them to express themselves in sand boxes. They begin to express their repressed emotions by projecting both their positive and negative emotions and they undergo processes to gain insight into themselves. Therefore, they can find self-healing power to heal themselves and relieve their emotional difficulties.

The purpose of the present study was to examine whether the stress reported by parents of child clients could be relieved through sandplay therapy. To this end, along with self-reporting questionnaires, brainwaves were measured that enable checking stress values through physiological changes in cranial nerves.

Brainwave measurement detects wavelengths from the brain and enables the analysis of emotional states through brainwaves that appear based on the level of tension or relaxation of memories of stimuli (Laxtha, 2008). In addition, psychological responses such as tension and stress can be seen from the characteristics of brainwaves (Hinrich & Machleidt, 1992). As such, stress affects brainwaves. If the brain perceives external stimuli as stress, the body secretes hormones to regulate its metabolism in relation to the stress. That is, the degree of physical and mental stress can be seen through changes in brainwaves. Alpha (α) waves are generated when the body and mind have been stabilized and are in a comfortable state and serve the role of moving the clarity of consciousness to the brain. Beta (β) waves appear dominantly in acting states. Cranial nerves consume large amounts of energy when beta (β) waves are generated. If this state persists, the brain feels limitations in information processing or responses and thus lacks concentration. Alpha (α) waves increase while energetic attacks or pleasure is experienced. Beta (β) waves appear when anxiety or fears are experienced and if this state persists, emotions and stress will affect brainwaves (Lee, 2003). Stress induces the central nervous system to respond so that alpha (α) waves among brainwaves decrease and beta (β) waves increase while inducing the autonomic nervous system to respond, resulting in physiological responses such as increases in blood pressure and pulse rates.

To review previous studies of sandplay therapy related to brainwaves, the results of a

study indicated that as an effect of sandplay therapy on the brainwave values related to the depression of parents of children who visited counseling institutes, depression decreased (Kang et al., 2011). In a study of the effects of sandplay therapy on the post-traumatic stress disorder and brainwaves of women who suffered from domestic violence, it was reported that sandplay therapy had positive effects of improving post-traumatic stress and related brainwave values (Lee, 2012).

In the present study, the reduction of the stress of parents of child clients who visited counseling institutes through sandplay therapy will be examined through both self-reporting measurements and brainwaves as physiological responses.

2. Research problems

In the present study, to examine whether sandplay therapy was effective in reducing the stress of parents of children who visited counseling institutes, the research problems were set as follows:

- 1) Can sandplay therapy reduce the stress of parents of children who visited counseling institutes?
- 2) Can sandplay therapy change the brainwave values related to the stress of parents of children who visited counseling institutes?

II. Study Method

1. Study subjects

The subjects of the present study were parents of children who visited a child counseling center located in the Chungnam region. Through a study subject recruitment advertisement, a total of thirteen parents were recruited. Orientations and interviews were undertaken with the recruited subjects and sandplay therapy was implemented thereafter. The personal data of the thirteen subjects of the present study are shown in Table 1.

Table 1. Personal data on the participating group

Subject	Sex	Age (year)	Occupation	Education
A	Female	35	Office Worker	University graduate
B	Male	35	Service	College graduate
C	Female	47	Housewife	University graduate
D	Female	40	Housewife	High school graduate
E	Female	39	Office Worker	University graduate
F	Male	42	Profession	High school graduate
G	Female	35	Housewife	University graduate
H	Female	36	Housewife	High school graduate
I	Female	35	Housewife	High school graduate
J	Female	35	Housewife	University graduate
K	Female	38	Office Worker	High school graduate
L	Female	40	Housewife	High school graduate
M	Female	37	Housewife	High school graduate

Table 2. Personal characteristics of the children who visited the counseling institute

Subject	Variable	Group	No. of cases (person)	%	
Children who visited the counseling institute	Age	4~6 years	4	30.8	
		7-9 years	4	30.8	
		10~12 years	5	38.4	
		Total	13	100.0	
	Order	First child	4	30.8	
		Second child	5	38.4	
		Only child	4	30.8	
		Total	13	100.0	
	Sex	Male	9	69.2	
		Female	4	30.8	
		Total	13	100.0	
	Counseling in progress	Play Therapy			
		Sandplay Therapy	3	23.0	
Speech therapy		5	38.5		
Snoezelen		2	15.4		
Snoezelen & speech Therapy		1	7.7		
Play Therapy & learning therapy		1	7.7		
Total		13	100.0		

The personal characteristics of the children of the thirteen parents who are the study subjects, that is, the children who are receiving counseling treatment at the counseling institute are presented as follows (Table 2).

2. Measurement tools

1) Symptoms of stress (SOS)

In the present study, the symptoms of stress (SOS) were used as a tool to measure stress responses. This scale was developed in 1977 in the USA and revised and supplemented by Lee So-wu (1991). Among a total of 94 questions, 34 questions concern mental and psychological responses. Each question is a 3-point scale for points ranging from 1 through 3 and the average score appears higher when stress is higher. This scale is divided into four sub-scales: depressive symptom group (8 questions), anxiety symptom group (11 questions), emotional instability (anger) group (8 questions), and cognitive power disorder group (7 questions).

The Cronbach coefficient of the entire reliability of the symptoms of stress used in the present study was .88 and the questions and reliability values by sub-variable are shown in Table 3.

Table 3. Subcategories and questions of the symptoms of stress

Subcategory	No. of questions	Question number	Reliability
Depressive symptom group	8	1, 8, 9, 15, 21, 22, 30, 32	.81
Anxiety symptom group	11	2, 10, 12, 13, 17, 19, 20, 25, 26, 31, 34	.71
Emotional Instability (anger) group	8	3, 6, 11, 14, 18, 24, 27, 33	.73
Cognitive power disorder group	7	4, 5, 7, 16, 23, 28, 29	.57

2) Electroencephalogram (EEG)

In the present study, a brainwave measurement system (EEG-4; LXE3204, Laxtha Inc, Korea) was used to measure brainwaves. The EEG-4 system measures brainwaves in four

regions of the surface of the head in a monopolar method. Brainwaves were measured at positions Fp1, Fp2 F3, and F4 in order in accordance with the 10-20 electrode system of the International Federation of Societies for Electroencephalography and Clinical Neurophysiology.

3. Study design and procedure

The procedure of the present study was composed for parents of children who visited the counseling institute as a one-group pretest-posttest experimental design for a sandplay therapy program. To examine the degrees of stress of the children's parents who participated in the experiment, SOS tests were conducted before the sandplay therapy program began and after the program was finished. A preliminary session for orientation and a questionnaire survey was implemented in one week, an ex post facto session for termination and a questionnaire survey was implemented in one week and sandplay therapy was implemented once per week for 45 minutes for ten weeks. To examine the process of changes in brainwaves, brainwaves were measured before and after the session biweekly while the program was in progress.

Brainwaves were measured in a stable state after a waiting time of ten minutes before the session and were measured immediately after the session of sandplay therapy. The participants were provided with boxes containing dry sand, black sand, or water sand in a sandplay therapy room and were given a brief explanation about the process of making sand scenes.

4. Data analysis method

Brainwaves were analyzed using power spectral analysis, which is one of methods of analyzing the frequencies of brainwaves. In power spectral analysis, brainwaves are assumed as linear combinations of simple vibrations at certain frequencies and the signals are broken down into individual frequency components to indicate the sizes (power) of the components. Power spectral analysis is mainly used to observe and analyze brainwaves (Laxtha, 2008). Stress brainwave values used to examine stress based on brainwaves were calculated by obtaining representative values for points of 95% of brainwaves at 0-50Hz using a brainwave analysis

system (Complexity 2.9, Laxtha). Among data obtained by data analysis, quantitative data was statistically processed using the computer statistics program SPSS 18.0. Paired *t*-tests were conducted to examine the prior and ex post facto significances of brainwaves and the SOS.

III. Study Results

1. Can sandplay therapy reduce the stress of parents of children who visited counseling institutes?

SOS tests were conducted with parents of children who visited counseling institutes and the following results were obtained.

Table 4. Differences in SOS scores of parents of children who visited counseling institutes before and after the program

Variable	Before/after	N	Mean	Standard deviation	<i>t</i>
Stress	Before	13	64.61	8.98	6.52*
SOS	After	13	54.00	6.98	

**p*<.05

As shown in Table 4, the SOS scores of all the participants before and after the program were compared with each other, and the result indicated that scores in ex post facto tests were significantly lower than scores in preliminary tests ($t=6.52, p<.05$).

2. Can sandplay therapy change the brainwave values related to the stress of parents of children who visited counseling institutes?

The parents' stress-related brainwave values were measured to check whether sandplay therapy would reduce the stress of parents of children who visited counseling institutes. The

resultant prior/ex post facto brainwave values are shown in Table 5 below.

As shown in Table 5, the entire subjects' stress-related brainwave values were checked. According to the results, the mean of scores before the program was 20.20, and the mean of scores after the program was 12.33. Therefore, scores after the program were significantly lower ($t = 4.34, p < .05$).

Table 5. Differences in the entire subjects' stress-related brainwave values between before and after the program

Variable	Before/after	N	Mean	Standard deviation	t
Brainwaves	Before	13	20.20	8.17	4.34*
	After	13	12.33	8.12	

* $p < .05$

The stress-related brainwave values of parents of children who visited counseling institutes before and after session by channel measured biweekly are briefly shown in the following table.

Table 6. Brainwave values before and after each session by channel

Session	ch=1	ch=	ch=	ch=	Mean
1	Before	20.13	20.20	27.12	23.44
	After	23.98	25.37	33.27	28.34
2	Before	23.79	24.13	29.5	26.53
	After	23.09	23.68	31.14	27.75
4	Before	20.02	20.65	27.58	23.92
	After	27.20	24.50	31.13	28.66
6	Before	22.87	21.17	28.88	25.00
	After	26.44	24.99	28.71	27.68
8	Before	20.06	19.76	27.77	23.75
	After	27.40	25.99	33.47	30.32
10	Before	18.02	16.37	27.32	22.60
	After	14.00	12.34	21.76	18.10

Table 6 shows the mean values by channel measured before and after each session. The brainwave values before and after session 10 by channel are smaller than the early and middle period brainwave values. The mean brainwave values for all channels before and after each session also decreased over time.

However, among values before and after individual sessions, values after some sessions are shown to be higher than values before those sessions. Discussion is considered necessary for these values.

IV. Discussion and Suggestions

In the present study, sandplay therapy was conducted on parents of children who visited counseling institutes and the effects of sandplay therapy to reduce the stress of the children's parents were checked. The results obtained in the present study are summarized and discussed as follows.

First, in the test of research problem 1, 'Can sandplay therapy reduce the stress of parents of children who visited counseling institutes?', it was found that stress significantly decreased ($t=6.52$, $p<.05$). This study result is consistent with the result of a study of saliva cortisol in which changes were observed in the stress responses of parents of child clients through sandplay therapy (Kim et al., 2012). Therefore, this result indicates that sandplay therapy can improve psychological stability and induce clients to experience positive emotions.

Second, in the test of research problem 2, 'Can sandplay therapy change the brainwave values related to the stress of parents of children who visited counseling institutes?', stress-related brainwave value scores significantly decreased ($t = 4.34$, $p<.05$). This result is consistent with the results of a study of brainwaves through sandplay therapy that tested its effects on reducing the depression of parents of children who visited counseling institutes (Kang et al., 2011), and a study of brainwaves conducted by Lee (2012) in which the effects of sandplay therapy to reduce the stress of women who suffered from domestic violence were tested. Higher brainwave values are shown when severe stress is felt. In a comparison of the brainwave values of all subjects before and after each session, the effects of sandplay therapy to

reduce the stress of parents of children who visited counseling institutes can be observed. This means that the subjects were overcoming their states of physical and mental tension and anxiety and developing a better ability to cope with their environments. Therefore, they can be considered to be less stressed by their children with behavioral problems and effectively coping with their children's problems.

According to Jung (1984), emotional experience that cannot be understood or solved by cognitive methods can be dealt with by giving visual forms to the experience. In the process of play, clients can change the world, break down old things and build new things, make their own worlds and obtain opportunities to look at themselves objectively while looking at what they have made. Through these processes, sandplay therapy awakens the innate healing power in individuals' unconsciousness and enables individuals to overcome stress, emotional adjustment, and suspended animation. Therefore, sandplay therapy can be a therapeutic intervention for the stress of parents of children who visited counseling institutes that would enable these parents to perceive and express their emotions and effectively reduce their stress. However, while undergoing the processes of sandplay therapy, participants may feel confusion or pain such as depression at the stage of gaining insight into themselves and becoming aware of things in their unconsciousness. These factors may cause brainwave values to remain unchanged after sessions or go up in a negative direction. There were some subjects whose brainwave values had gone up after all program sessions were finished. They may be considered to be stressed due to the finish because of their personal difficulties that were not solved through the ten sessions as the number of sessions was insufficient. Given this fact, programs that continue until the individuals' problems are resolved should be developed.

Finally, based on the results obtained in the present study, the limitations of the present study and matters that should be considered in later studies are suggested as follows. First, when testing the effects of sandplay therapy on the stress of parents of children who visited counseling institutes, no control group was set. Therefore, differences between the experimental group and a control group could not be checked.

Overall, the effects of sandplay therapy on brainwaves were examined through brainwave tests. Although the subjects were made to wait for ten minutes in stable states for

ten minutes before brainwave tests, the situations of external factors other than the treatment of the subjects could not be controlled. Considering the foregoing, studies that utilize diverse scientific tools together with brainwaves should be activated. Third, although sandplay therapy sessions were implemented once per week for 10 weeks in the present study, long-term sandplay therapy is necessary for subjects with other emotional difficulties along with chronic and severe stress.

References

- Ahn, Y. O. (2001). *A study on the depression of children with attention deficit hyperactivity disorder and their mothers*. (Master's thesis). Chonnam National University, Gwangju, South Korea.
- Bae, G. W., & Song, S-C. (1986). A study for comparison of child rearing stress between parents of children with disabilities and parents of general children. *Sungji Rehabilitation Research*, 3, 13-35.
- Bratton, S. C., Landreth, G., Kellam, T., & Blackard, S. R. (2006). *Child parent relationship therapy (CPRT) treatment manual: A10-Session filial therapy model for training parents*. New York: Routledge.
- Dyson, L. (1993). Response to the presence of a child with disabilities: Parental stress and family functioning over time. *American Journal on Mental Retardation*, 98(2), 207-218.
- Harman, D., & Brim, O. G. (1980). *Learning to be parents: Principles, programs, and methods*. CA: SAGE. (Korean trans. 1990)
- Hinrichs, H., & Machleidt, W. (1992). Basic emotion reflected in EEG coherences. *International Journal of Psychophysiology*, 13(3), 225-232.
- Jung, C. G. (1984). *Man and his Symbols*. New York: Anchor Books. (Korean trans. 2009)
- Kang, I. A., Jang, M., Kim, J. K., & Kim, M. K. (2011). The effect of sandplay therapy on depression and EEG of parents having children in psychotherapy. *Korea Journal of Child Welfare*, 9(3), 39-60.
- Kang, S. K. (2002). The impacts of the attitudes, stress coping, and social supports of parents with handicapped children upon the life satisfaction of the parents. *Journal of Mental Health*

& *Social Work*, 14(12), 7-35.

Kim, K. W. (2009). A preliminary survey for the effective parent consultation in play therapy. *Korean Journal of Play Therapy*, 12(1), 47-63.

Kim, Y. M., Jang, M., Kim, M. K., & Kim, J. K. (2012). The effects of sandplay therapy on parenting stress and saliva cortisol levels of parents undergoing child counseling programs, *Korean Journal of Child Studies*, 33(3), 83-97.

Laxtha. (2008). *Outline the electroencephalogram*. Retrieved from <http://www.laxtha.com/SiteView.aspx?x=7&y=32&z=33&infid=155>

Lee, M. Y. (2012). *The effects of sandplay therapy on post-traumatic stress disorder and brain-waves of female domestic violence victims*. (Unpublished Master's thesis). Namseoul University, Cheonan, South Korea.

Lee, S. W. (1991). Stress reaction pattern of Koreans: Immigration of Koreans to the United States. *Journal of Korean Academy of Nursing*, 22(2), 238-247.

Lee, Y. H. (2003). *The effect of attention and memory on alpha wave-relax training program in students with cerebral palsy*. (Unpublished Doctoral dissertation). Daegu University, Daegu, South Korea.

Oh, H. J. (2008). *A study on mother's playfulness comparison between general children and child patients under play therapy*. (Unpublished Master's thesis). Sookmyung Women's University, Seoul, South Korea.

Park, J. K. (2008). *The effects of non-directional speech therapy using playing with sand on the improvement of spontaneous verbalization of autistic child*. (Unpublished Master's thesis). Daegu University, Daegu, South Korea.