Minnesota multiphasic personality inventory of school sandplay group therapy with maladjustment behavior in Korean adolescent

Abstract

School sandplay group therapy is a useful clinical treatment method for adolescents who cannot adapt to school due to various emotional and behavioral problems. In this study, we conducted 10 weeks of group therapy in 70 adolescents referred to as maladjustment behavior problem in the school. The purpose of this study was to evaluate the clinical effects of sandplay therapy on the emotions and behaviors objectively through Minnesota Multiphasic Personality Test-2. There was a statistically significant difference in clinical scales such as depression, masculinity-femininity, social introversion, anger, subjective depression, need for affection, somatic complaint, and internal/external alienation after school sandplay group therapy. Sandplay therapy is estimated to have clinical effects not only on the emotional problems of maladapted high school students but also on physical problems.

Abbreviation: MMPI = Minnesota Multiphasic Personality Test-2.

Keywords: group therapy, maladapted adolescent, Minnesota multiphasic personality test-2, school sandplay

1. Background

Sandplay therapy has become a popular method in Western and Latin America, especially in East Asia such as Japan and China, as well as Korea, which are suitable for cultural conditions. In Korea, sandplay therapy has changed from a descriptive study of individual cases to a study of small-scale group counseling. In particular, sandplay group counseling with a large number of people is being implemented in school counseling sites. Sandplay therapy has become a popular method in Western and Latin America, especially in East Asia such as Japan and China, as well as Korea, which are suitable for cultural conditions. In Korea, sandplay therapy has changed from a descriptive study of individual cases to a study of small-scale group counseling. Sandplay group counseling is being applied to local communities, disaster-prone areas, institutions and organizations such as schools and hospitals. In addition, compared to classical individual case studies, the sandplay group counseling is easy to conduct.

A number of previous studies reported the clinical therapeutic effect of sandplay therapy on children with various problems. Armstrong reported that group sandplay therapy for adolescents who cannot adapt to school due to various emotional and behavioral problems. Lowenfeld stated that sandplay therapy was effective in reducing aggressive behavior in children. In the study of Noyes, sandplay therapy enhanced rapport formation in students, improved their self-esteem, alleviated their internal conflicts, and improved their reading ability. Shen and Armstrong reported that group sandplay therapy for adolescents had the effect of improving their self-esteem. In the study of Allan and Berry, children’s emotional states and their participation in school life were improved after a total of eight sessions of sandplay therapy at school. Pearson and Wilson reported the alleviation of negative emotions and memories and an increase in positive emotions in children exposed to abuse or trauma after sandplay therapy.

In Korea as well, some studies have been conducted on the effects of sandplay therapy on children or adults with various problems. Seo reported that sandplay therapy had a positive effect on depression, anxiety and withdrawal syndrome. After long-term sandplay therapy, there was a case in which separation anxiety from the mother was improved and emotional security and self-awareness, and the relationship with the mother were improved. In the study of Hahm over a total of 15 sessions of sandplay therapy for a 5-year boy with aggression, a decrease in aggression, an increase in positive emotions and the enhancement of self-perception in the client were observed. Most of sandplay therapy studies published so far in Korea were case studies or conducted on a small subject group of around 10 subjects. In addition, most of the studies have been carried out on children while few studies have dealt with adolescents and no study has ever investigated more than 30 subjects. Therefore, the researchers of this study investigated the effects of group sandplay therapy on the emotional, behavioral, and cognitive states of 70 adolescents with problematic behavior...
Table 1  
Progress of sandplay group therapy and contents of program.  

| Step          | Progress of sand play group counseling                                                                 | Time (min) |
|---------------|--------------------------------------------------------------------------------------------------------|------------|
| Intro & promise | Introduction to sand play group counseling. (Only to talk about “promise together” for group counseling every time and talk aloud) | 5          |
| Step 2 Create | After touching the sand a lot and making your own work quiet. (Allow the adolescents to decorate freely and the adolescents who does not want to decorate sit quietly, touching the sand, or lying down) | 15–20      |
| Step 3 Share  | Introduce your work to each group and share your feelings with your friends. (Not being late, not being absent, not penalized) | 20         |
| Step 4 To class | We promise to keep the story of the meeting during the consultation time as a secret between the members of the group. | 5          |
| Step 5 Clean up & record | After leaving the adolescents, the counselor observes the adolescents’s activities, records the work story, takes pictures, cleans up the work, and holds a counselor meeting with the school counselor. | 30–50      |

based on professional clinical evaluation, and by using the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) as a standardized measurement tool.

2. Methods
2.1. Ethical review

All subjects were provided with explanations on the purpose of this study through a questionnaire, and only those who agreed informed consent with it participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of Dankook University (Project identification code DKU 2019-05-003).

2.2. Study subjects

This study was conducted on 70 students in the first to third year of two high schools in Cheonan city. In 2016, the research team received an application from the local community high-school to conduct the ‘In-school sandplay group counseling program’ for students who maladjusted in high schools. Two schools were selected and the program was conducted. The schools consisted of about 900 full-time students, and about 300 each grade. Through Adolescent Mental Health and Problem-behavior Questionnaire (AMPQ) for all students, researchers classified the risk group for choosing the participant. After meeting with school counselors and homeroom teachers was held for the selection of the study subjects based on the risk group, and finally, only the students who agreed to participate in the program were selected.

Consent on the participation in the study was given from the selected subjects and their parents, after which a school sandplay group therapy program was implemented during personality education hours at school. The final study subjects consisted of 34 boys (48.6%) and 36 girls (51.4%), who were on average aged 16.30 ± 0.20 years. The program was conducted from August 2016 to July 2018 for the subjects, who were divided into three groups, and a total of 8 sessions of school sandplay group therapy was provided to them for 10 weeks during semester. The group therapy was conducted once a week, for 50 minutes per session (Table 1)(Table 2). Each student was provided with a sand tray measuring 72 cm in width, 57 cm in height and 7 cm in depth. About 12 to 16 students created their sand tray scenes in the therapy room. After finishing sandplay therapy, each group comprised of 3 to 4 students, led by a therapist assigned to the group, presented and talked about their sand tray scenes. A primary therapist and 3 to 4 assistant therapists provided the counseling. Fifty minutes were allocated for treatment, and another 50 minutes for cleaning up sand tray created by adolescents and discussion. The program consisted of 10 sessions including baseline evaluation, 8 sessions of therapy, and post evaluation. The study subjects were pre-interviewed by a sandplay therapy specialist (an approved member of the International Society for Sandplay Therapy) who was the primary therapist, and those with intellectual disability or organic brain syndrome history were excluded from the study. No physical abnormality was found in the subjects in regular health screenings and physical examinations performed at school.

2.3. Study tools
2.3.1. Epidemiological questionnaire. The questionnaire consists of questions about gender, age, educational level, past medical history.

2.3.2. Adolescent Mental Health and Problem-behavior Questionnaire (AMPQ). The AMPQ is a self-report questionnaire and a school-based mental health screening test for middle- and high-school students that was developed by Jung et al[11] psychiatrist and mental health expert in Korea.

The test paper is designed to facilitate the test in the school environment with 34 relatively short questions. Cronbach alpha of these 34 items was .88. And correlation with K-YSR and K-CBCL were .34 (P < .01) and .68 (P < .01).

The test was revised to a second version in 2011 by Bhang et al[12] to the AMPQ-II. It is a multidimensional tool consisting of 5 factors with 38 items on psychological problems and experience of adverse life events during the last month, such as mood, suicidal ideation, thought problems, anxiety, somatization, sleep, inattention, impulsivity, peer relationships, family
Table 2
Contents of program of sand play group therapy.

| Session | Process | Contents of program |
|---------|---------|---------------------|
| 1       | Contact | Departure of the journey of the mind. Express freely. |
| 2       | Search 1| Feeling and expressing basic emotions such as irritation, anger, joy, happiness. |
| 3       | Feeling | Remembering the events and experiences I have had, and share inner feelings. |
| 4       | Search 2 | Meeting negative emotions such as irritability, anger, sadness, and loneliness. |
| 5       | Movement 1 | Expressing my path of the negative me, the positive me, the past me, the present me, etc. |
| 6       | Movement 2 | Freely expressing emotions that come to mind when thinking about friends, school, and family. |
| 7       | Choice | Express all the works that I have been expressed in an integrated way through the title "I" |
| 8       | Acceptance 1 | Imagine a new "me", a future "me". Expressing a growing and mature "I". |

Pre/Post test is carried out separately.

conflict, violence, and bullying. Each item is evaluated on a 4-point scale (0-not at all, 1-slightly, 2-quite, and 3-very much).

In the study by Bhang et al., the AMPQ-II had high internal consistency and test–retest reliability (Cronbach α = 0.89 and r = 0.567), and a positive correlation was observed between the AMPQ-II and the Symptom Checklist-90-Revision (r = 0.20–0.70, P < .01). From the total score of all questions cut-off score which can be classified as risk groups for males was 32 and 30 for females.

2.3.3. Minnesota Multiphasic Personality Inventory-2, MMPI. The MMPI[13] is the most widely used and most studied objective personality test in the world. The MMPI was developed by Hathaway, a clinical psychologist at the University of Minnesota, and Mckinley, a psychiatrist, in the 1940s, as a means of objectively measuring abnormal behavior. The test is rated on 10 clinical scales measuring the types of major abnormal behavior and 4 validity scales assessing the test taker’s attitude. After the first standardization of the test in 1963 in Korea, the version restandardized by the Korean Psychological Association in 1989 has been widely used in clinical and counseling setting such as hospitals and schools. Subjects are asked to choose either of two answers (“yes” and “no”) for each item. The MMPI-2 revised in 1999 consists of 566 items.

2.3.4. Data analysis. All statistical analyses were performed using the Korean version of SPSS 15. Sex was analyzed using cross tabulations analysis. The paired t-test was used to compare MMPI score before and after sand play. Statistical significance was defined as P < .05.

3. Results

3.1. Demographic characteristics of the subjects

Of the 70 participants, 34 were boys (48.6%) and 36 were girls (51.4%). The average age of participants was 16.30 ± .92 years.

3.2. Clinical effect of sand play

There was a statistically significant difference in depression scale score, depression (t = 2.05, P = .044), masculinity/femininity (t = -2.50, P = .015), social introversion (t = 2.20, P = .031), negative emotionality (t = 2.92, P = .005), anger (t = 2.06, P = .043), subjective Depression (t = 2.46, P = .017), need for affection (t = 2.24, P = .028), somatic complaints (t = 2.07, P = .042), self-other alienation (t = 2.05, P = .045) after sand play compared to baseline (Table 3).

4. Discussion

In this study, therapeutic effects were observed on the depressive symptoms of the subjects after sandplay therapy. There have been several previous studies showing that sand play therapy have therapeutic effect on emotional symptoms. Allen and Berry[6] found that children's emotional states improved after a total of eight sessions of sandplay counseling. There was a case study showed that in a child exposed to abuse and trauma, the negative emotions were alleviated and the positive emotions increased after the sand play therapy. Among Korean studies, Seo[8] reported the relief of depression and anxiety and withdrawal syndrome after sandplay therapy, and Park[15] found that sandplay therapy alleviated the depressive symptoms of adolescent victims of domestic violence. However, no significant change was observed in anxiety symptoms after sandplay therapy in this study. Han and Song[9] reported that a long-term sandplay therapy resulted in a decrease in separation anxiety, but this is not consistent with the results of this study. Unlike in the study of Han and Song[9] the sandplay therapy was conducted for 70 adolescents and provided in the form of a short-term group therapy. In addition, data were analyzed with anxiety symptoms as a covariate in this study, which seems to lead to difference in findings between the preceding study and this study, given the close relationship between depressive symptoms and anxiety symptoms.

Meanwhile, therapeutic effects on reducing anger were observed after sandplay therapy in this study, which is consistent with the results of preceding studies[3,10] reporting the improvement of aggressive symptoms. In addition, this study observed the significant therapeutic effects of sandplay therapy on somatic symptoms based on clinical subscales. This is a new finding that has never been reported in previous studies. This study showed improved need for affection, which seems to be consistent with the results of previous studies reporting the effects of sandplay therapy on improvement in attachment. Attachment is highly
### Table 3

Changes in MMPI characteristics after 10 weeks of sandplay therapy.

| Scale                        | Before sandplay therapy (n = 70) | After 10 weeks of sandplay therapy (n = 70) | t     | P-value |
|------------------------------|----------------------------------|---------------------------------------------|-------|---------|
|                              | M ± SD                           | M ± SD                                      |       |---------|
| **Validity scales**          |                                  |                                             |       |         |
| VRIN                         | 49.29 ± 11.05                    | 49.72 ± 10.65                              | −0.034| 0.973   |
| TRIN                         | 58.37 ± 7.27                     | 58.10 ± 6.66                               | 0.283 | 0.775   |
| F                            | 52.03 ± 10.88                    | 52.96 ± 12.33                              | −0.982| 0.33    |
| Pb                           | 54.41 ± 12.06                    | 53.86 ± 13.20                              | 0.564 | 0.575   |
| Fp                           | 49.67 ± 9.14                     | 51.03 ± 11.62                              | −1.233| 0.222   |
| MPS                          | 52.40 ± 11.07                    | 50.74 ± 11.20                              | 1.869 | 0.066   |
| L                            | 48.84 ± 10.84                    | 49.83 ± 11.50                              | 0.93  | 0.355   |
| K                            | 48.23 ± 11.03                    | 49.91 ± 11.84                              | −1.877| 0.065   |
| S                            | 50.44 ± 11.66                    | 51.87 ± 12.94                              | −1.875| 0.065   |
| **Clinical scales**          |                                  |                                             |       |         |
| Hs                           | 50.61 ± 9.97                     | 49.74 ± 9.38                               | 0.92  | 0.361   |
| D                            | 51.11 ± 11.56                    | 49.17 ± 10.92                              | 2.048 | 0.044   |
| Hy                           | 50.86 ± 9.54                     | 49.59 ± 9.83                               | 1.338 | 0.185   |
| Pd                           | 51.33 ± 11.64                    | 51.04 ± 11.37                              | 0.258 | 0.797   |
| Mt                           | 48.73 ± 8.93                     | 51.60 ± 9.58                               | −2.494| 0.015   |
| Pa                           | 55.27 ± 14.03                    | 54.59 ± 13.61                              | 0.519 | 0.605   |
| Pt                           | 55.29 ± 13.40                    | 54.46 ± 12.14                              | 0.706 | 0.483   |
| Sc                           | 52.94 ± 12.15                    | 53.70 ± 12.32                              | −0.777| 0.440   |
| Ma                           | 52.70 ± 12.74                    | 53.24 ± 12.58                              | −0.452| 0.653   |
| Si                           | 54.40 ± 13.05                    | 52.69 ± 13.90                              | 2.021 | 0.031   |
| **Content scales**           |                                  |                                             |       |         |
| Anxiety                      | 54.21 ± 14.15                    | 53.00 ± 15.31                              | 1.042 | 0.301   |
| Fears                        | 50.66 ± 12.60                    | 50.73 ± 11.74                              | −0.072| 0.943   |
| Obsessiveness                | 56.07 ± 14.66                    | 55.00 ± 15.92                              | 0.022 | 0.980   |
| Depression                   | 56.69 ± 15.96                    | 54.51 ± 16.25                              | 1.851 | 0.068   |
| Health concerns              | 51.41 ± 13.35                    | 50.31 ± 13.18                              | 1.034 | 0.305   |
| Bizarre motions              | 53.51 ± 13.82                    | 52.69 ± 14.09                              | 0.727 | 0.470   |
| Anger                        | 52.90 ± 13.90                    | 50.63 ± 12.98                              | 2.064 | 0.043   |
| Cynicism                     | 49.67 ± 11.78                    | 48.84 ± 12.82                              | 0.727 | 0.434   |
| Antisocial practices         | 52.11 ± 12.82                    | 52.60 ± 14.56                              | −0.434| 0.665   |
| Type A behavior              | 51.84 ± 13.52                    | 51.80 ± 13.90                              | 0.041 | 0.967   |
| Low self-esteem              | 56.77 ± 14.36                    | 55.29 ± 15.13                              | 1.523 | 0.132   |
| Social discomfort            | 55.07 ± 14.35                    | 54.81 ± 15.30                              | 0.266 | 0.791   |
| Family problems              | 52.73 ± 16.35                    | 50.46 ± 14.07                              | 1.784 | 0.079   |
| Work interference            | 55.43 ± 15.49                    | 53.43 ± 15.25                              | 1.831 | 0.071   |
| Negative treatment indicator | 54.29 ± 13.77                    | 52.16 ± 13.89                              | 1.935 | 0.057   |
| **Clinical subscales**       |                                  |                                             |       |         |
| D                            | 52.24 ± 12.22                    | 49.80 ± 12.84                              | 2.455 | 0.017   |
| Psychomotor retardation      | 48.30 ± 9.30                     | 47.29 ± 8.96                               | 0.971 | 0.335   |
| Physical malfunctioning     | 52.97 ± 10.23                    | 51.71 ± 11.87                              | 0.997 | 0.322   |
| Mental dullness              | 50.03 ± 13.16                    | 48.61 ± 12.44                              | 1.449 | 0.152   |
| Brooding                     | 53.65 ± 13.74                    | 51.59 ± 14.66                              | 1.775 | 0.080   |
| Hy                           | 45.39 ± 10.55                    | 46.93 ± 10.71                              | −1.619| 0.110   |
| Denial of social anxiety     | 51.96 ± 9.88                     | 49.66 ± 10.83                              | 2.239 | 0.028   |
| Need for affectation         | 52.50 ± 12.13                    | 50.39 ± 12.45                              | 2.07  | 0.042   |
| Inhibition of aggression     | 47.07 ± 10.48                    | 47.40 ± 9.72                               | −0.323| 0.748   |
| Sc                           | 52.90 ± 13.46                    | 53.57 ± 13.64                              | −0.685| 0.496   |
| Social alienation            | 53.59 ± 11.81                    | 53.36 ± 11.30                              | 0.193 | 0.847   |
| Lack of ego mastery- Cognitive | 53.40 ± 13.64              | 51.94 ± 13.64                              | 1.378 | 0.173   |
| Lack of ego mastery- Conative | 55.44 ± 13.64            | 54.63 ± 13.76                              | 0.697 | 0.488   |
| Lack of ego mastery- Defective inhibition | 53.57 ± 13.18 | 52.89 ± 13.38 | 641 | 0.524   |
| Bizarre sensory experiences | 53.81 ± 12.82                    | 51.89 ± 13.83                              | 1.919 | 0.059   |
| Si                           | 53.99 ± 11.49                    | 52.71 ± 11.73                              | 1.426 | 0.148   |
| Social avoidance             | 50.79 ± 10.37                    | 51.13 ± 11.63                              | −0.367| 0.715   |
| Self/Others alienation       | 53.46 ± 11.26                    | 51.14 ± 13.28                              | 2.045 | 0.045   |

Clinical scales: D = Depression, F = Infrequency, Fb = Back infrequency, Fp = Infrequency psychopathy, Hs = Hypochondriasis, Hy = Hysteria, K = Correction, L = Lie, M = Mean, Ma = Hypomania, MF = Masculinity-femininity, MMPI-2 = Minnesota Multiphasic Personality Inventory-2, Pa = Paranoia, Pt = Psychopathic deviate, Pf = Psychasthenia, Si = Supertative self-presentation, Sc = Schizophrenia, SD = Standard deviation, Si = Social introversion, TRIN = True response inconsistency, Validity scales; VRIN = Variable response inconsistency.
related to physical contact, so it is presumed that sandplay, which involves physical contact with sand, can have a significant effect on improvement in attachment and need for affection.

In addition, a decrease in social introversion was observed after sandplay therapy in this study, which is consistent with the findings of Allen and Berry[11] reporting that children’s participation in school activities increased after sandplay therapy; and the results of the study of Jo[16] reporting that sandplay therapy led to the improvement of elementary school students’ adaptation to school. In the present study, a significant increase in the scores on Scale S (Masculinity-femininity) was observed. While no significant increase was experienced among male students (t = -0.816, P = 0.421), female students showed a significant increase in the scores (t = -2.801, P = 0.008). It is estimated that after sandplay therapy, they are less depressed and have increased coping with more diverse social roles.[17]

The limitations of this study are as follows. First, the subjects of this study were the adolescents whose chief complaint was problematic behavior, and therefore, it is likely that they were not able to give correct answers in tests due to various situational factors. In addition, though the MMPI has proven its reliability with the various validity scales and has the merit that it can be used not only for the evaluation of emotional symptoms, such as depression and anxiety, but also for the assessment of behavioral symptoms such as aggression and mania, it still has limitations as a self-report test. Second, the subjects of this study were conducted in a specific area, who do not represent the entire group of adolescents with problematic behavior. Also, although there are many types of adolescents with problematic behavior, this study did not carry out the evaluation of detailed clinical characteristics depending on these types. Therefore, it will be necessary to identify the characteristics unique to this group of adolescents through discriminant analysis or clustering analysis of a wide range of patient groups. Third, this study did not conduct a full comparison of various confounding variables such as the economic state, academic achievement, and parental environment of the subjects. Therefore, it is deemed that more clinical follow-up studies on adolescents with problematic behavior complementing these drawbacks will be needed in the future. In addition, double-blind crossover studies involving a general control group will be necessary for the study of the clinical effects of sandplay therapy.

Adolescence is a crucial stage in the development of an individual. In modern society, prolonged adolescence has led to social-psychosocial moratorium period. Korean youths are highly likely to suffer mental sufferings because they have socially limited outlets for emotional and physical expressions.[18] Sandplay group therapy is also effective in alleviating various problem symptoms of different groups as it is an expressive counseling technique for external and internal problems through a nonverbal medium.[19] Therefore, it is thought that sandplay group therapy for adolescents is suitable for treating various symptoms and a large number of subjects for a short period of time. In addition, though group therapy does not have as high efficiency as individual treatment, it can provide sufficient effects on improvement in interpersonal relationships and social skills in adolescents, along with benefits in terms of time and costs.[20] Depression has a strong influence on adolescents’ suicidal ideation[21] and adolescent depression levels have a significant impact on their adaptation to school life.[22] In this study, sandplay group therapy at school showed significant effects on the alleviation of depressive symptoms in adolescents. This suggests that sandplay group therapy at school may be effective for adolescents with depressive and somatic depressive symptoms. As sandplay therapy is expected to have positive clinical effects on suicidal accidents and school adjustment in adolescents, it is suggested that additional research and development of school sandplay group therapy programs suitable for the school environment be needed in the future.

5. Conclusions

The purpose of this study was to investigate the clinical effects of sandplay therapy on the emotion and behavior of adolescents by conducting a 10-week group sandplay therapy for 70 adolescents. After the sandplay therapy program, in comparison with the baseline measured before the program, statistically significant differences were observed in the scores on the scales such as depression, masculinity - femininity, social introversion, anger, subjective depression, need for affection, somatic complaint, and internal/external alienation. From this, it is presumed that sandplay group therapy at school has clinical effects on the improvement of emotional problems in adolescents with problematic behavior.

Author contributions

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