Original article

Structured Association Technique (SAT) Imagery Work Preventing Depression through Focusing on Self-Image among Japanese Female University Students

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Abstract

The purpose of the present study was to evaluate the effectiveness of structured association technique (SAT) imagery work on preventing depression among Japanese female university students through improving self-image. Subjects were divided into two groups; an intervention group and control group. The intervention group participated in SAT imagery work approach which aims to improve the people's self-image. The control group was given a lecture about mental health by a physical education teacher. In the intervention group, the scores on the self-esteem and problem solving behavioral trait scales significantly increased, while the scores on the self-repression behavioral trait scale and the SDS scale significantly decreased after

intervention. In the control group, none of these scores showed significant change. One possible interpretation for the current results is that because of the self-image of the participants among intervention group changed positively, changes their feelings and thoughts for the future changed to positive ones, which result in ameliorate depression. Moreover, the students among intervention group could perceive more emotional support from fellow students, which might be contribute to the increase in the measures score.

Keywords: SAT imagery work
Depression
Prevention
Self-image
Female university students

1. Introduction

The mental disorder of university students has been well documented in the literature. For example, the rate of neurotics of students was higher than that of other life stage groups [1]. Another study reported that mental health problems have become long-term problems and although students with probable mental disorders are aware of the need for treatment, they do not receive treatment [2]. The preventive treatments are required also because of the symptoms of depression in adolescences are considered to predict an episode of major depression in adulthood [3]. Recently, David et al. has reported that subthreshold depression in adolescence may increase the risks of later depression and suicidal behaviors [4]. Lewinsohn et al. carried

out a family study and reported that subthreshold depression has a considerable effect on the continuity of major depressive disorder [5]. Recently, school-based cognitive behavioral therapy(CBT) programs on preventing depression and anxiety have been designed, implemented and evaluated [6] [7] [8]. For example, Peden et al. reported that female students participated in a 6-week cognitive behavioral intervention that targeted identification and reduction of negative thinking, using thought stopping and affirmations [9]. As a result, participators experienced greater decreases in depressive symptoms and negative thinking in addition to a greater increase in self-esteem than those in the control group.

CBT has been focusing primarily to change the irrational cognition to adaptive cognition through activating the function of the frontal cortex. However, when the amygdala related to the evaluation of emotion is overly activated, emotions cannot be controlled, making the change to an adaptive cognition difficult. This is due to nondeclarative memory attention or implicit memory, which is one of the two memory systems described by LeDoux [10], and is formed by fear conditioning with unconscious. Thus, the application of the conventional CBT is limited, and it is necessary to develop new methods focusing on changing nondeclarative memory.

It has been pointed out that as one of influential factors, parenting style is associated with depression. For example, self-esteem of adolescents and parenting style has been reported as risk factors for depression. [11]. Another study also been reported that the most potent

predictors of major depression onset for adolescent girls included subthreshold depressive symptoms, poor family function, low parental support, bulimic symptoms, and delinquency [12]. Moreover, parenting style is highly associated with physical and mental symptoms of children [13], and some studies with university students as the samples showed that parent's image have strong impact on the self-image [14] [15]. All of those past studies, parent's image was examined with the Parent Bonding Instrument (PBI) [16].

However, the representation of parent's facial expression is important to form parent's image because humans can obtain a lot of information from facial expression in a moment, and the facial expressions are very important element of non-verbal communication. Ueda et al. focused on the representation of parent's expression of disgust (tension and nervousness) for university students [17]. The group with high scores on the disgusted parent's expression showed higher scores on self-denial, trait anxiety and depression than the low-score group. Moreover, the parent's image script, which is formed based on the recognized support from their parents and the representation of parent's facial expression, positively affects the self-image script and ameliorate depression and trait anxiety [18]. Hence, in the current study we considered it necessary for supporting students to improve the self-image script through changing the representation of parent's facial expressions and focused on imagery work by structured association technique (SAT therapy). SAT therapy is used to support people finding problem

solving methods using intuition in the state of consciousness or altered state of consciousness (meditation) [19]. It is such kind of method that can change the past image memory to a positive image in the state of meditation, and change the ways of feeling and thinking. It focuses on the fact that the most of the brain system almost has a neural plasticity and aims to modify the past negative memory to positive one by creating a new image in the brain. Moreover, Munakata proposed the concept of image-script, which consists of sensory and emotional information. Sensory information is input from the senses of sight, hearing, smell, and taste as well as somatic sense [19]. Emotional information is memorized in the amygdala such as sadness, fun and fear. SAT imagery work aims to modify the image script to new one. In a SAT-based intervention research for Chinese college students, the score on the perceived emotional support increased and their self-image was improved by SAT therapy [20]. For cancer survivors, a study showed that the cortisol level decreased, the S-IgA level increased, and the scores on the trait anxiety, depression and self-repression behavioral trait scales decreased after the intervention [21].

The purpose of this study is to examine the use of SAT imagery work for the prevention of depression of Japanese female university students on the basis of the following hypotheses: 1) The scores on the self-esteem and problem solving behavioral trait scales will increase after intervention. 2) The scores on the self-repression behavioral trait scale and the self-rating

depression scale will decrease after intervention.

2. Methods

2.1 Participants

The intervention group consists of 42 female nursing students in Japan, who attended the "Theory of health behavior" class. The control group consists of 12 female students in Japan. We used a single – blind technique for internal validity.

Ethical Considerations

We explained to the participants orally and in writing that they would not be personally identified, and that the participation will be based on free will. Approval was obtained from the Ethical Committee of Graduate School of Comprehensive Human Sciences, University of Tsukuba.（No. 22-169）

2.2 Measures

We distributed self-rating questionnaires for both groups before and after the intervention.

(1)Scale of self-esteem (10 items; score range, 0-10 points). The scale was developed by Rosenberg [22] . We used the scale translated by Munakata et al. [23].

(2) Scale of self-repression behavioral trait (10 items; score range, 0-20 points]. The scale was developed by Munakata [24]. The scale measures the degree of tendency to suppress his or her feelings to avoid being disliked by others.

(3) Scale of problem problem solving behavioral trait (10 items; score range, 0-20 points]. The

scale was developed by Munakata [23]. The scale measures the degree of tendency to actively and effectively cope with a problem.

(4) Scale of the self-rating depression (SDS) (20 items; score range, 20- 80 points]. The scale was developed by Zung [25]. We used a Japanese version [26]. The higher the score are the higher the depressive tendency.

2.3 Procedures

The duration of the program was approximately one hour for both the intervention group and the control group. For the intervention group, the program was carried out during the "Theory of health behavior" class and the instruction was given by Dr. Munakata, who developed SAT imagery work. After the guidance about imagery work, the subjects participated in peer training. During the imagery work, the subjects were basically in the state of mediation. Following a counseling sheet, Step1 they were asked whether they wish to have brothers and sisters, which are called spiritual key person (SKP) in the imagery work. "SKP imagery method (Munakata, 2011)" and "3-generation imagery therapy" (brief version, Munakata, 2011) were used for the SAT imagery work [27]. Munakata assumes that SKP is based on knowledge of microchimerism, which meant the presence of cells from another individual in the body system. For example, Yan et al. reported that male microchimerism in women without sons includes pregnancies, unrecognized spontaneous abortion, vanished male twin, and an older brother transferred by the

maternal circulation, or sexual intercourse [28]. Fetal cells are present long after birth in the maternal body and usually fetal microchimerism is beneficial for mothers [29]. In imagery work, such other's cells are embodied as SKP to imagine positive expressions (*e.g.*, smile and calm). Step2, we change the representation of parent's facial expressions to positive expressions. The parent's facial expression was measured by the objective scale of parent's facial expression assessment. SKP and Parents were different concepts. In SAT imagery work, we hypothesized that we exist brothers and sisters who wish to born on image. We called it SKP (Spiritual Key Person). This mean is to assume that the life was supposed to birth. The purpose of this method was to change SKP and parent's facial expression into positive expressions.

The subjects were asked to select a drawing or a religious image (images related to Buddhism) that they thought represented a surrogate similar to SKP and parent's facial expressions. Moreover, the subjects were instructed look repeatedly of the picture so that the image was built in the brain thought frequent stimuli on the basis of long-term potentiation (LTP) in neural activity pattern [30].

The control group received a lecture on mental health by a physical education teacher. This concept was so far method to preventing depression. We examined this concept in both the two group. The contents of the lecture included mental health (major depression disorder), psychological stress, effective stress coping techniques, and the importance of sleep. These

topics were a part of enlightenment activities related to mental health currently proposed and referred to the mental support site for the younger presented by the Ministry of Health, Labour and Welfare in Japan.

2.4 Data analysis method

Two-way analysis of variance (ANOVA) was conducted using two groups the intervention and control groups as a between-subjects factor and survey time (before and after the program) as a within-subjects factor. SPSS 12.0J for Windows, a statistical software package, was used for statistic analysis in this study.

3. Results

3.1 Comparison of baseline values between intervention and control groups

By comparing the baseline values, the demographics of age showed a significant difference between the intervention group (N=42) and the control group (N=12). The other scales showed no significant difference (Table 1).

Table 1 Baseline values between intervention and control groups

	Intervention Group (N=49)			Control Group (N=12)				
	25	50	75	25	50	75		*p* value
age	19	19	20	18	18	19	z=-3.257	**
self-esteem	2.3	4.0	6.0	2.0	5.0	6.0	z=-.531	n.s.
self-expression behavioral trait	9.0	12.0	13.0	8.3	10.5	14.8	z=-.021	n.s.
problem solving behavioral trait	6.8	9.0	11.3	8.0	10.0	13.0	z=-1.437	n.s.
self-rating depression (SDS)	36.8	40.0	47.3	33.3	41.5	50.3	z=-.063	n.s.

Mann-Whitney test ** $p<.01$

3.2 Change in scale value after intervention

Two-way ANOVA (mixture design) was performed and the following results were obtained. The time×group interaction effect for the self-esteem score was statistically significant (F=（1, 51）=10.65, p<.05). Sub-effect test showed significant changes in the intervention group after intervention(F=（1, 103）=58.05, p<.001). However, in the control group, no significant changes were observed. Analysis of the self-repression behavioral trait score showed a statistically significant time×group interaction effect (F=（1, 52）=17.99, p<.001). Sub-effect test showed significant changes in the intervention group after intervention (F=（1, 104）=24.42, p<.001). However, in the control group, no significant changes were observed. When considering the problem solving behavioral trait score, a statistically significant time×group interaction effect was observed (F=（1, 51）=11.03, p<.01). Sub-effect test showed significant changes in the intervention group after intervention (F=（1, 103）=23.13, p<.001). However, in the control group, no significant changes were observed. For the SDS score, a statistically significant time ×group interaction effect was observed (F=（1, 52）=3.48, p<.10). Sub-effect test showed significant changes in the intervention group (F= after intervention（1, 104）=9.69, p<.05). However, in the control group, no significant changes were observed. (Figure 1- Figure 4)

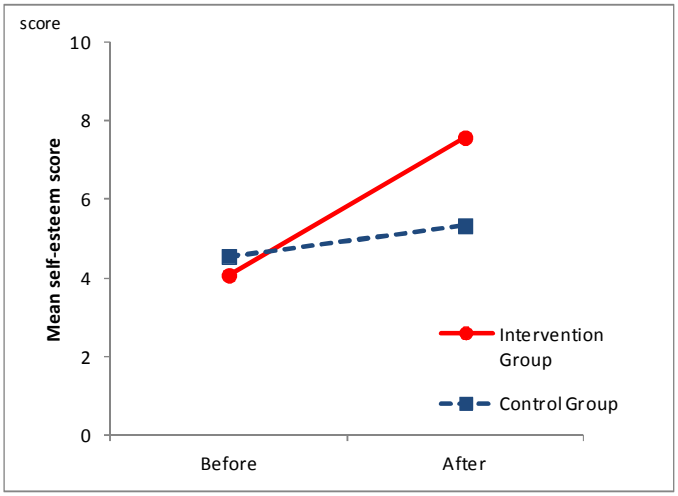

Figure 1 Mean self-esteem score for each group at pre-post assessment

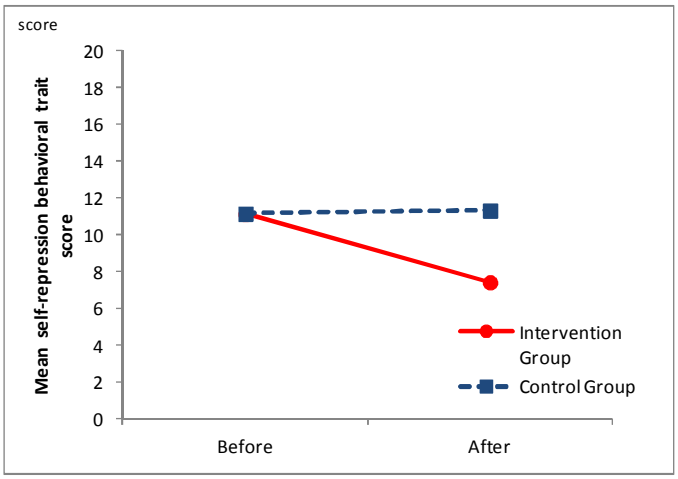

Figure 2 Mean self-repression behavioral trait score for each group at pre-post assessment

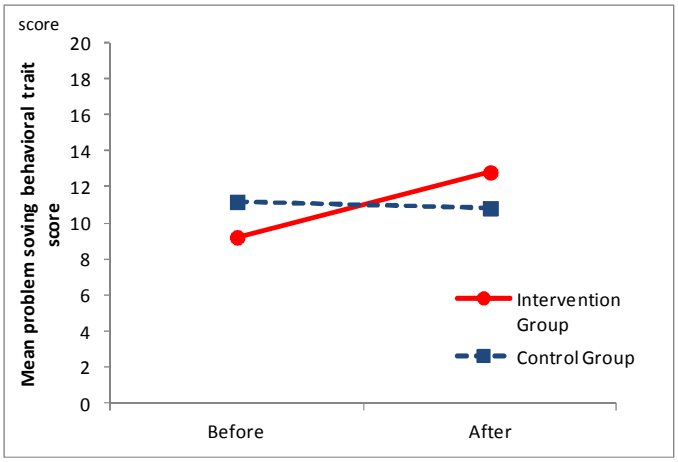

Figure 3 Mean problem solving behavioral trait score for each group at pre-post assessment

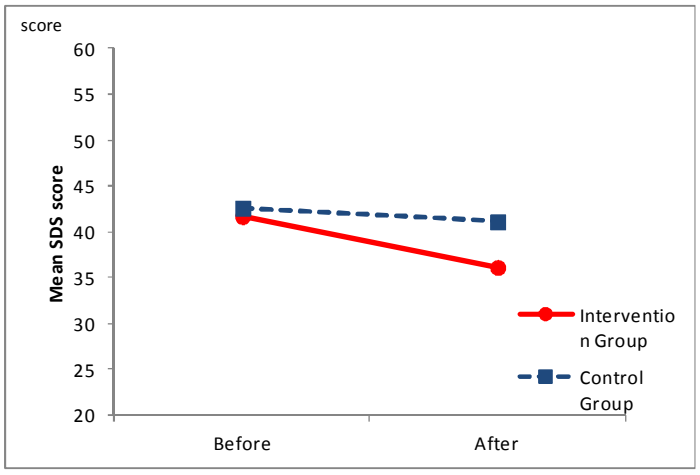

Figure 4 Mean SDS score for each group at pre-post assessment

4. Discussion

In the intervention group, the scores on the self-esteem and problem solving behavioral trait scales increased, and the score on the self-repression behavioral trait and SDS decreased after intervention. In the control group, none of these scores significantly changed. The contents that the control group received were about mental health. This dissemination of knowledge is important for students to prevent the symptoms. However, the current findings indicated that it is not reliable as prevention method for depression. The expectant results of the intervention group might be because the self-image of the participants was improved by imagery work, resulting in the changes of the ways of feeling and thinking. For example, some participants answered “always” toward the question “I feel depression” before intervention. When their self-image script was changed to a positive one after intervention, they answered “No/occasionally”. We considered that the positive self-image script enabled the participants to

think positively, which resulted in the changes in score of depression. Why did the self-image script change to positive? The imagery work assumes the existence of SKP to improve the representation of parent's facial expressions. If participants imagine smiling and calm expression of the SKP and think that the SKP always guards them, their demand level toward to parents will be decreased and their parental image changed automatically as well. As a result, they have a positive self-image and improve the score of self-esteem and depression.

Munakata explained this as that the level of expectation for parents decreased in the presence of SKP as providers [27]. By perceived more emotional support, the participants became confident and the scores on the self-esteem and problem solving behavioral trait scales increased. Moreover, the imagery work was carried out as peer training among the participants. It has been reported that peer support helps reduce symptoms of depression [31] [32]. It seems that the scores were enhanced by support from classmates through the practice.

Moksnes et al. pointed out that it is important to increase self-esteem for preventing depression [33]. The reports also show that positive self-image emphasizes the resilience to depression [34]. Therefore, the increased score on the self-esteem scale is considered to be meaningful. As mentioned above, the self-repression behavioral trait scale measures the tendency to suppress one's feeling to avoid being disliked by others. Munakata et al. pointed that since people with high scores on the interpersonal dependency and self-repression are likely to

feel self-hatred, they lower their self-esteem and have the tendency to become anxious and depressed [35]. It has also been reported that people who tend to obey others have fear of abandonment and excessively repress their feeling as well [36]. Therefore, the change from a self-repression -type person to a self-assertion-type person becomes necessary. In this study, the participants obtained new emotional support from SKP and improved representation of their parent's facial expression thought SAT imagery work. Therefore, they felt a sense of security and did not overly repress to their feelings. As a result, the score on the self-repression behavioral trait scale decreased after the intervention.

Other approaches using imagery work include imagery rehearsal therapy [37] and imagery rescripting and reprocessing therapy (IRRT) [38]. IRRT aims to change the abuse imagery to produce a more favorable outcome and it has been applied to people with, for example, social phobia [39] and bulimia nervosa [40]. However, the above methods target people with severe symptoms and they are not suitable for general students. On the other hand, SAT imagery work is a practical method that can be used for anyone who has undergone some training. However, because the subjects are not randomized in this research, this study has a limitation in the interpretation of the results. In the future, we will examine the effect of intervention by a randomized controlled trial. We will also examine the effect for a wide range of university students in addition to nursing students. Imagery work was carried out as peer. Peer support

systems have been adopted in peer education to prevent sexually transmitted infection [41], school bullying [42] [43], and type 2 diabetes [44]. However, the application of peer support to prevent depression has not yet been reported. Imagery work is a practical method that can be carried out by students alone. Moreover, it only requires selecting the positive parental facial expression or SKP that will be a guardian from the drawing or a religious image and frequently stimulate the brain by looking at it. In the future, we will train university instructors and consider expanding practical use of this imagery work in other universities.

5. Conclusions

We examined the effectiveness of SAT imagery work to improve self-image to prevent depression among Japanese female university students in Japan. The subjects were divided into two group; an intervention group (N=42) and control group (N=12). The intervention group participated in SAT imagery work to change the representation of parental facial expressions. The intervention group showed significant improvements in self-image and the scores on the behavioral trait and depression scales. In contrast, the control group did not show significant improvements in these factors. These results indicate that the SAT imagery work is effective for preventing depression among female university students. In the further, we will examine the effect of intervention by a randomized controlled trial.

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