

Effects of brief depression prevention program based on Cognitive Behavior Therapy among college students: a randomized controlled trial

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Objective: Preventing depression is an important issue in adolescence. We investigated the effects of a brief depression prevention program based on cognitive behavior therapy (CBT). For the purposes of this study, in the field of CBT, we focused on cognitive therapy (CT) and rational emotive behavior therapy (REBT).

Methods: We conducted a randomized controlled trial on 148 college students. The intervention group participated in one 90-minute group session conducted by a clinical psychologist. Then the students did homework exercises for 2 months following that session.

Results: The results of a mixed-effects model showed that there was a significant interaction between the group and time observed for the K6 (the Kessler 6-Item Psychological Distress Scale) ($P = 0.02$). The effect size (Cohen's d) was 0.55 (95% confidence interval, 0.16 to 0.93).

Conclusions: These findings suggest that a brief depression prevention program based on CBT (CT and REBT) could help prevent depression and improve the mental health of college students.

Key words: cognitive therapy, rational emotive behavior therapy, cognitive behavior therapy, prevention, depression, college students

Introduction

Recently gradually worldwide, the biggest problem to hinder health conditions is becoming clinical depression. In this article, we describe pathological depression as clinical depression, and feelings of depression as depression. There were estimated to be 322 million people worldwide with depression in 2015, which had increased by about 18% from 2005 to 2015.¹ Clinical depression was ranked third in the Global Burden of Diseases in 2004, but it is predicted to be No. 1 in 2030.² This means that in countries around the world, clinical depression is becoming the most important issue not only in the mental health domain but also in the whole health domain. In other words, clinical depression seems to be becoming the biggest risk factor threatening the survival, achievement and well being of people all over the world.

The first line of depression therapy excluding medication therapy is clarified by randomized controlled

trial (RCT) of the previous study that it is cognitive therapy (CT) and rational emotive behavior therapy (REBT) which are representative theories of psychotherapy included in cognitive behavior therapy (CBT).^{3,4} In CT and REBT theory, it is assumed that some psychological problems are caused by dysfunctional cognition, but CT and REBT differ in their thinking about dysfunction subject to transformation. CT theory, aims at erroneous inference called, "automatic thought" and transformation of distorted linguistic expression.⁵ On the other hand, REBT theory is focused on transforming cognition called irrational belief centered on absolute demands, such as "must," "have to," "should," and "ought to," into rational belief, which in turn create functional emotions.⁶ Interestingly, there was a previous meta-analysis on the relationship between irrational beliefs and psychological distress that concluded that irrational beliefs are positively associated with depression.⁷ According to previous studies, it is believed that CBT's most effective treatment strategy for major depressive

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disorder is to integrate REBT and CT and, if possible, subject the irrational beliefs to direct intervention.⁸

CBT was widely applied not only as a treatment for clinical depression but also as a preventive program.⁹ In the meta-analysis of previous studies on depression prevention programs, there were 15 of 19 studies on RCT programs based on the theory of CBT.¹⁰ REBT is applied as a program to maintain and promote mental health for elementary, junior high and high school students, and adults.¹¹⁻¹⁸ In addition, the meta-analysis of depression prevention programs for children and adolescents reveals that programs with homework exhibit larger effects.¹⁹

According to previous studies in Japan, other than the elderly, it is clear that the degree of depression is highest in people aged 15 to 24.²⁰ Moreover, studies indicate that adolescent depression is a risk factor for clinical depression in adulthood.^{21,22} Therefore, it is necessary to examine and validate programs to help prevent depression in adolescents.

In a previous study on prevention of depression targeting adolescence (13 to 19 years old) in men and women, the brief group CBT program based on the technique of cognitive restructuring and behavioral activation (6 weekly, 1-hour sessions), compared to the cognitive behavior (CB) bibliotherapy group during the follow-up for 2 years, was associated with the onset of major depressive disorder and has been shown to be significantly lower.²³ Studies with university students who scored 14 or higher on the BDI-II (Beck Depression Inventory-II) showed that in a single treatment of behavioral activation for 90 minutes, large effect sizes of depression degree, environmental reward, and clinically significant improvement were shown.²⁴ Additionally, in a pre-post test of a brief program based on the column technique which is the main technique of CBT for college students (2 hours of workshop per week and homework all 3 weeks), there was no statistically significant difference in negative automatic thoughts.²⁵ As in the previous study, preventive treatments based on the principle of CBT are not effective on automatic thoughts; contrarily others are, some studies show the effects and results are mixed.²⁵ For example, in the control group study on depression prevention among college students in Japan, 4 weekly individual sessions were conducted once a week (total 3 weeks) based on CT.²⁶ That study reported that the program was very effective in reducing the degree of depressed moods in college students, significantly reducing the frequency of negative automatic thoughts. That program mainly performs behavioral activation and cognitive reconstruction (i.e., the column technique).²⁶ In addition, in RCT studies on depression

prevention based on the principle of REBT, the group-based REBT program conducted for university students with blindness showed a significant decrease in the depression score after intervention and at follow-up.²⁷

However, intervention studies by RCT on CBT for depression prevention for college students are few in Japan, and as far as the authors had found in their investigated in the last 10 years, there is one case that stands out.²⁸ On the other hand, verification of effectiveness of prevention education programs based on CBT for the workplace.²⁹⁻³² Preventive interventions are classified into three categories, namely universal preventive interventions, selective preventive interventions, indicated preventive interventions, by the IOM (International Organization of Migration) in the United States.³³ These studies in the workplace were universal preventive interventions conducted for all the people there. When thinking about universal preventive interventions of adolescence, using college classes can be considered. Effective preventive education that can be implemented in a class at college will enable the provision of mental health care to more adolescents.

The purpose of this study is to evaluate the effects of a brief prevention program (a one time 90-minute group class and follow-up homework exercises for 2 months with workbooks) based on CT and REBT for depression among college students.

Materials and Methods

Participants and Procedures

There were 148 participants who were students of the psychology department of a college in Japan. Using a computer-generated table of numbers, participants were randomly assigned to 1 of 2 groups: the intervention group participated in a brief depression prevention program based on CBT and the control group participated in a DVD viewing program on psychology.

After the study was completed, due to ethical considerations, the control group was also provided with the same type of intervention that the intervention group received. No exclusion criteria were set. This study was approved by the Kitasato University School of Allied Health Sciences Ethics Committee (Permission number: 2016-007) and the professor in the class at the college where the interventions were made. This study was registered in the UMIN-Clinical Trials Registry (UMIN-CTR) with a test ID of UMIN000035191.

Intervention

This brief depression prevention program was developed

Table 1. Outline of program content

Group session (once in 90 minutes)
1. Exercise focusing on your thoughts, emotions, behavior, physiological responses (10 min)
2. Outline of Cognitive Behavior Therapy (10 min)
3. Outline of Column Technique in Cognitive Behavior Therapy (20 min)
4. Try the Column Technique (30 min)
5. Understand Dysfunctional Beliefs and Functional Beliefs (5 min)
6. What is Behavioral Activation? (5 min)
7. Check the homework (5 min)
8. Reflect on what I learned today (5 min)
Homework (continue for 2 months after group session)
1. Try the Column Technique on the worksheet (≥once a week)
2. Read the Dysfunctional Beliefs and Functional Beliefs (≥once a day)
3. Read the Commentary on Behavioral Activation

based on CT and REBT standard manuals for depression treatment.^{34,35} In the program for the intervention group in the present study, among the CBT techniques, we chose the main techniques from Beck's CT and the key techniques from REBT. The outline of the program content is summarized in Table 1. The interventions were a 90-minute group session and 2 months of follow-up homework exercises on basic CBT skills. The group session was conducted by a clinical psychologist who had received over 20 hours of training from a specialist in CT and over 84 hours of training from a specialist in REBT. To make enable the participants to tackle their own problems with depression as homework by themselves, we have chosen the following 3 techniques, key techniques of CT and REBT: the column technique, dysfunctional beliefs and functional beliefs, and behavioral activation. In the column technique section, participants learned that changing their way of thinking would change their feelings. Then in the dysfunctional beliefs and functional beliefs section, the participants learned that there are 2 ways of thinking, one is dysfunctional that causes depression and functional that helps to alleviate depression. These are known as irrational and rational beliefs in the REBT theory. At this point in the REBT theory, we focus on a belief that is thought to be the most relevant to the depressed mood.³⁶ In the behavioral activation section, the participants learned that in order to calm the feelings and to motivate little by little, it is important to gradually increase activities that you can feel enjoyable, rewarding, and calming. Behavioral activation is considered the CT and REBT technique to be addressed first in clinical depression therapy.^{34,35}

These were carried out in group sessions. The lectures used examples that could occur in the students' everyday

college life, such as problems with human relationships at a part-time job. These column technique exercises were done by participants individually using worksheets. We attempted to allow for more effective learning during the exercises by asking participants to complete worksheets on which there were unpleasant events that the participant had actually experienced.

On the other hand, participants in the control group watched DVDs on psychology unrelated to CBT, and they wrote their impression after viewing them. By the way, The DVDs we used were "Bijuaru kyoikushinrigaku nyumon 7 seinenki-no koyukankei (Introduction to Visual Educational Psychology No. 7 Fellowship Relationships in Adolescence)" (SUN EDUCATIONAL, 2009) and "Bijuaru rinshoshinrigaku nyumon 13 sutoresu to utsubyo (Visual Clinical Psychology Introduction No. 13, Stress and Depression)" (SUN EDUCATIONAL, 2005). The group session time in both the intervention and the control groups was 90 minutes.

Measurements

Outcomes

The outcome was assessed by evaluating the differences between the groups at 1 month and 2 months after the group session using standardized self-administered questionnaires. The survey consisted of the following components.

The National Institute of Mental Health (NIMH) Center for Epidemiologic Studies – Depression Scale (CES-D): The original version of this is a scale developed by the NIMH for the purpose of discovering depression in the general population. In this research, we used the Japanese version.³⁷

The Japanese version of the Kessler 6-Item Psychological Distress Scale (K6): This is a scale developed for the

purpose of screening mental diseases such as depression and anxiety disorder.³⁸ A higher score represents a poorer state of mental health.

Automatic Thoughts Questionnaire – Revised (ATQ-R):

This was translated from the original English version into a Japanese version.³⁹ This is a questionnaire to measure automatic thoughts that are thought to generate negative feelings in CT. A high score suggests a high tendency of negative automatic thoughts.

Japan Irrational Belief Test-20 (JIBT-20): This is a questionnaire to measure the strength of the individual's irrational beliefs.⁴⁰ A high score represents a tendency to strongly believe in irrational beliefs.

Basic attributes

We administered a pre-intervention questionnaire asking about the following basic attributes: gender, age, grade, and medical history of mental health. Continuous variables were evaluated using *t*-tests, and categorical variables were evaluated using χ^2 tests.

Randomization

An independent researcher who had no direct contact with the participants used random computer-generated numbers to divide the participants into the intervention and control groups. Analysts were masked during analysis regardless to which group the participants were assigned.⁴¹

Statistical analyses

The sample size of this study relies on a guideline for determining the number of samples in order to maintain sufficient detection power.⁴² Assuming that the recommended statistical power is 0.8, and the effect quantity considered reasonable from the clinical point of view is moderate, it is estimated that 64 people in each group would be needed. The intervention effect was evaluated by investigating the significance of the interaction between group and time, using the mixed-effects models (group, time, and group \times time interaction as fixed effects, and randomized participants as random effect). The effect size was investigated by comparing the difference in outcome score values of the 2 groups 1 month and 2 months after the group session. Analysis after intervention was conducted for participants who gave complete responses to the questionnaire. All tests used $P < 0.05$ as indicating a significant difference. Statistical analyses were conducted using IBM SPSS Statistics Subscription.

Results

Study flow

Figure 1 shows a flow diagram for participation in this study. A total of 148 participants initially registered for this study and were randomly assigned to 1 of 2 groups: 74 participants to the intervention group and 74 participants to the control group. Of the 74 participants in the intervention group, 69 (93.2%) responded to the pretreatment questionnaire and participated in the group session for the intervention group. Of these 69 participants, 61 (88.4%) responded to the questionnaire 1 month after the group session, and of these 61 participants, 54 (88.5%) responded to the questionnaire 2 months after the group session. Of the 74 participants in the intervention group, 65 (87.8%) responded to the pretreatment questionnaire and participated in the group session for the intervention group. Of these 65 participants, 60 (92.3%) responded to the questionnaire 1 month after the group session, and of these 60 participants, 55 (91.7%) responded to the questionnaire 2 months after the group session.

Baseline data

The baseline attributes of participants were based on questionnaire responses from 134 respondents who obtained complete responses from all registrants (Table 2). A total of 28.4% of the participants were male (27.5% in the intervention group and 29.2% in the control group) with an average age of 19.6 years (19.6 in the intervention group and 19.6 in the control group). There was no significant between the 2 groups' differences in gender, age, grade, or medical history on mental health. Table 3 shows baseline scores for each group. No significant differences between the groups were observed. Cronbach's α was ≥ 0.70 for all measurements. And the reliability of the scale was confirmed and would be maintained.

Intervention effects

Tables 4 and 5 show summaries of the results of the intervention 1 and 2 months after the group session, respectively. A significant interaction was observed between group and time for the outcome of K6 ($F(2, 230.5) = 3.78, P = 0.02$). The difference between the scores of both groups 2 months after the session was 3.2 points, and the effect size (Cohen's *d*) was 0.55 (95% confidence interval, 0.16–0.93). For CES-D, ATQ-R, and JIBT-20, improvement trends were observed in the intervention group but did not show statistical significance. For each group \times time, the interactions

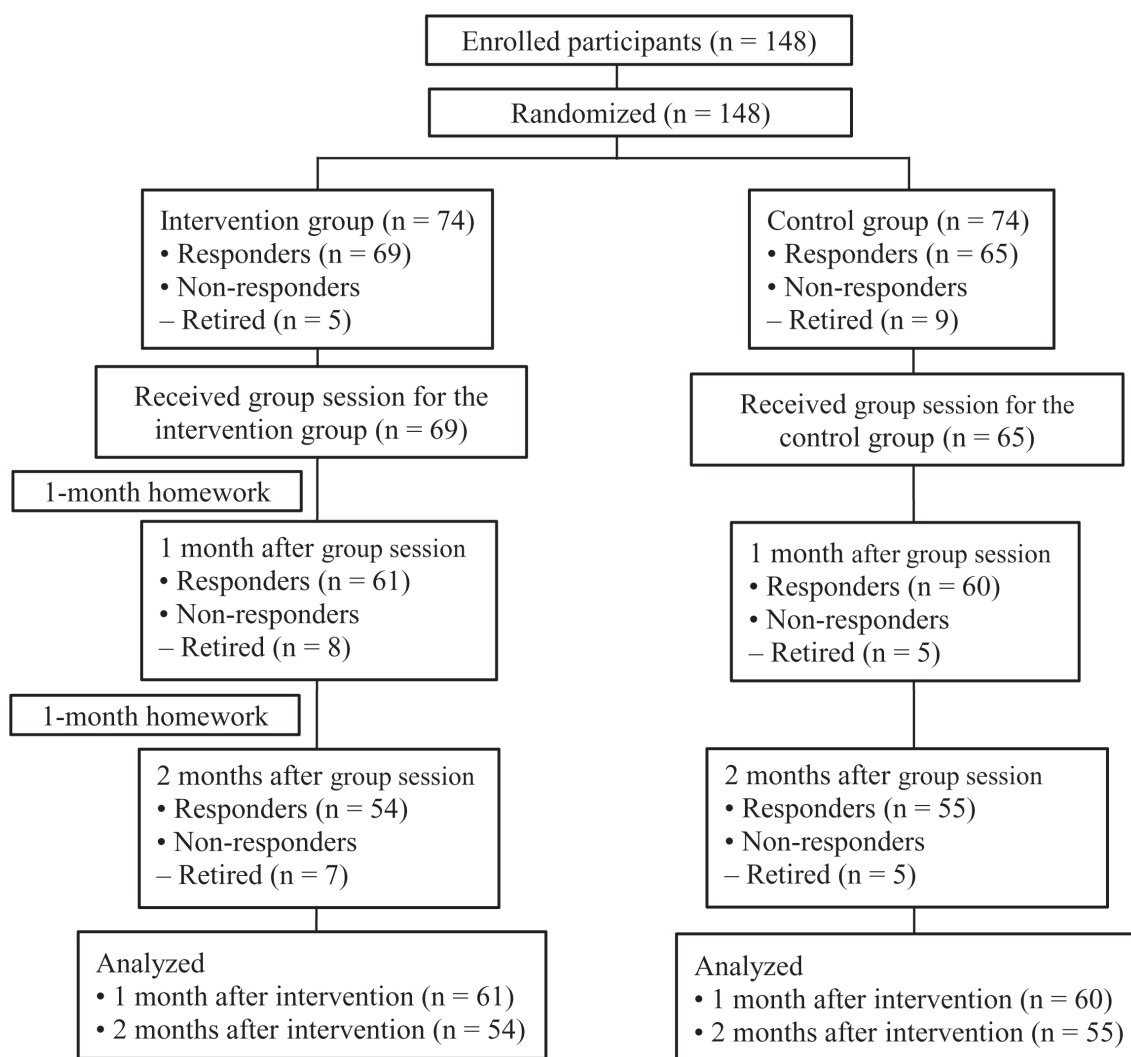


Figure 1. Study participation flow diagram

Table 2. Basic attributes in intervention and controlled groups

Variable	Total (n = 134)	Intervention (n = 69)	Control (n = 65)	P value
Gender, n (%)				
Male	38 (28.4)	19 (27.5)	19 (29.2)	0.83
Female	96 (71.6)	50 (72.5)	46 (70.8)	
Average age, years (SD)	19.6 (1.05)	19.6 (1.05)	19.6 (1.05)	0.85
Grade, n (%)				
First-year student	27 (20.1)	13 (18.8)	14 (21.5)	0.78
Second-year student	58 (43.3)	30 (43.5)	28 (43.1)	
Third-year student	48 (35.8)	25 (36.2)	23 (35.4)	
Fourth-year student	1 (0.7)	1 (1.4)	0 (0)	
Medical history on mental health, n (%)				
Never visited	127 (94.8)	66 (95.7)	61 (93.8)	0.64
Visited in the past	7 (5.2)	3 (4.3)	4 (6.2)	
Currently in the hospital regularly	0 (0)	0 (0)	0 (0)	

SD, standard deviation; Categorical variables, Pearson's χ^2 test; Continuous variables, *t*-test

were ($F(1,119) = 1.16, P = 0.28$; $F(1,119) = 0.07, P = 0.79$; $F(1,119) = 3.38, P = 0.07$, respectively).

Discussion

The results of this study indicate that the brief depression prevention program, based on CT and REBT, effectively improved mental health such as depression. In particular, a significant improvement was seen in the K6 score at 2 months after the end of the group session. For this reason, for college students who do not have the opportunity to systematically acquire basic knowledge and skills to cope with feelings such as depression, it is expected that

considerable improvement can be obtained by implementing this brief training program. College students are thought to have feelings such as depression in various situations, such as academic, circle and club activities, part-time jobs, careers paths, friendships, and family relations. Therefore, mastering knowledge and skills to improve negative feelings and promote functional behavior fulfills the needs of people who participated in the program.

In addition, this program focused on the 3 basic elements of CT and REBT to deal with depression and used a concise program that can be tackled on its own. In the participatory training in the column technique

Table 3. Baseline scores for each group

Variable	Mean (SD)			Cronbach's α	P value
	Total (n = 134)	Intervention (n = 69)	Control (n = 65)		
CES-D	21.3 (11.1)	19.7 (9.6)	23.0 (12.4)	0.91	0.09
K6	6.8 (5.8)	6.2 (5.3)	7.4 (6.2)	0.91	0.24
ATQ-R	65.1 (26.4)	64.4 (24.5)	65.9 (28.5)	0.96	0.74
JIBT-20	63.9 (8.2)	62.6 (8.9)	65.3 (7.2)	0.72	0.06

Table 4. Effects of depression prevention program (1 month after training)

	Mean Scores (SE)		Group \times time interaction*	Effect size (95% CI)
	Intervention (n = 61)	Control (n = 60)		
CES-D	18.9 (1.46)	23.8 (1.76)	0.45	0.39 (0.03 – 0.75)
K6	6.1 (0.71)	7.2 (0.74)	0.02	0.20 (0.03 – 0.75)
ATQ-R	66.2 (3.32)	67.6 (3.85)	0.33	0.05 (-0.31 – 0.40)
JIBT-20	62.4 (1.32)	65.8 (1.27)	0.97	0.33 (-0.03 – 0.69)

SE, standard error; CI, confidence interval

*P value assessed using liner mixed models, including group, time, and group \times time as fixed factors; participants as a random factor.

Table 5. Effects of depression prevention program (2 months after training)

	Mean Scores (SE)		Group \times time interaction*	Effect size (95% CI)
	Intervention (n = 54)	Control (n = 55)		
CES-D	18.9 (1.34)	22.8 (1.86)	0.45	0.33 (-0.05 – 0.70)
K6	4.5 (0.55)	7.7 (0.96)	0.02	0.55 (0.16 – 0.93)
ATQ-R	63.0 (3.66)	66.1 (4.41)	0.33	0.10 (-0.27 – 0.48)
JIBT-20	62.6 (1.37)	65.5 (1.05)	0.97	0.32 (-0.06 – 0.70)

focusing on the change of feelings, each participant practiced alone, recalling the feelings of the disgusting scenes they actually experienced. By experiencing the column technique during the group session, each participant seems to have experienced a change in their feelings. We thought that experiencing the changes in their feelings was helpful to understand the meaning of the homework exercise to read the dysfunctional beliefs and functional beliefs. In addition, the lecture on "Behavioral Activation" seems to have brought to the participants' attention the fact that emotions change by one's behavior. And the clinical psychotherapist who was in charge of the intervention group's session conducted programs used words easy to understand for the participating college students. The features of the program are thought to have helped participants to tackle the homework exercise. Statistically significant results were obtained in spite of the short time and single-group session form.

Limitations

Although improvement trends were observed for CES-D, ATQ-R, and JIBT-20 (which were the three outcomes in the intervention group), there were no statistically significant differences in the control group. One possible reason for this is that the program was too simple to deal with problems that are too difficult to tackle on one's own. The characteristics of our research intervention program are that it is a short-term group class session followed up by a short-term homework exercise, and it could be implemented during a class at college. To ensure that the program is offered to as many students as possible, it will be necessary to simplify the group session section to be held during class time. In order to prevent shortcomings due to the simplification of the program, it is helpful to provide questions by e-mail and e-learning.

In CBT, dysfunctional negative emotions are thought to arise from dysfunctional thoughts. Therefore, in order to improve dysfunctional emotions, we believe that it is necessary to change dysfunctional thoughts into functional thoughts. However, as a result of this research, no effect was found in automatic thoughts (measured by ATQ-R) and belief (JIBT-20). This point warrants further study. It would be helpful to examine the program and to verify all aspects of it, such as more positively introducing the REBT technique and allowing participants to work on their own "schema."⁵

Conclusions

This study evaluated the influence of a depression prevention program based on CBT (CT and REBT),

which can be implemented in classes for Japanese college students. A brief 90-minute group session and 2 months' homework (The Column Technique, The Dysfunctional Beliefs and Functional Beliefs, Behavioral Activation) significantly reduced the participants' mental health scores including depression on the K6. From these results, we concluded that the program may be an effective preventive approach to reduce depression that can be implemented in college classes. To make this conclusion more reliable, the authors think it will be necessary to verify the effectiveness of preventive programs based on CBT for college students.

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Conflicts of interest: None

References

1. World Health Organization, et al. Depression and other common mental disorders: global health estimates. 2017.
2. World Federation for Mental Health. Depression: A Global Crisis. 2012. Available at: http://www.who.int/mental_health/management/depression/wfmh_paper_depression_wmhd_2012.pdf. Accessed November 1, 2018.
3. David D, Szentagotai A, Lupu V, et al. Rational emotive behavior therapy, cognitive therapy, and medication in the treatment of major depressive disorder: a randomized clinical trial, posttreatment outcomes, and six-month follow-up. *J Clin Psychol* 2008; 64: 728-46.
4. Iftene F, Predescu E, Stefan S, et al. Rational-emotive and cognitive-behavior therapy (REBT/CBT) versus pharmacotherapy versus REBT/CBT plus pharmacotherapy in the treatment of major depressive disorder in youth; A randomized clinical trial. *Psychiatry Res* 2015; 225: 687-94.
5. Beck AT (ed.). *Cognitive Therapy of Depression*. New York: Guilford press; 1979.
6. Dryden W, DiGiuseppe R. *A Primer on Rational-Emotive Therapy*. New York: Research Press; 1990.
7. Vîsla A, Flückiger C, Grosse Holtforth M, et al. Irrational beliefs and psychological distress: a meta-analysis. *Psychother Psychosom* 2016; 85: 8-15.
8. Szentagotai A, David D, Lupu V, et al. Rational emotive behavior therapy versus cognitive therapy versus pharmacotherapy in the treatment of major depressive disorder: Mechanisms of change analysis. *Psychotherapy (Chic)* 2008; 45: 523-38.

9. Bennett-Levy J, Farrand P, Christensen H, et al. (ed.). *Oxford Guide to Low Intensity CBT Interventions*. New York: Oxford University Press; 2010.
10. Cuijpers P, van Straten A, Smit F, et al. Preventing the onset of depressive disorders: a meta-analytic review of psychological interventions. *Am J Psychiatry* 2008; 165: 1272-80.
11. Bernard ME. Emotional resilience in children: Implications for rational emotive education. *Romanian Journal of Cognitive and Behavioral Psychotherapies* 2004; 4: 39-52.
12. Di Pietro M. Rational emotive education in the school. *Romanian Journal of Cognitive and Behavioral Psychotherapies* 2004; 4: 69-77.
13. Knaus W. Rational emotive education: Trends and directions. *Romanian Journal of Cognitive and Behavioral Psychotherapies* 2004; 4: 9-22.
14. Vernon A. Rational-emotive education. *Romanian Journal of Cognitive and Behavioral Psychotherapies* 2004; 4: 23-37.
15. Trip S, Vernon A, McMahon J. Effectiveness of rational-emotive education: A quantitative meta-analytical study. *J Cogn Behav Psychother* 2007; 7: 81-93.
16. Vernon A. *Thinking, feeling, behaving: an emotional education curriculum for children. Grades 1-6*. Champaign: Research Press; 2006.
17. Vernon A. *Thinking, feeling, behaving: an emotional education curriculum for children. Grades 7-12*. Champaign: Research Press; 2006.
18. DiMattia DJ, Ijzermans T. *Reaching Their Minds: A Trainer's Manual for Rational Effectiveness Training*. New York: Institute for Rational-Emotive Therapy; 1996.
19. Stice E, Shaw H, Bohon C, et al. A meta-analytic review of depression prevention programs for children and adolescents: factors that predict magnitude of intervention effects. *J Consult Clin Psychol* 2009; 77: 486-503.
20. Sakamoto S, Tanno Y, Ohno Y. *Yokutsu no rinshoshinrigaku*. (Clinical psychology of depression.) Tokyo: University of Tokyo Press; 2005 (in Japanese).
21. Lewinsohn PM, Rohde P, Seeley JR, et al. Natural course of adolescent major depressive disorder in a community sample: predictors of recurrence in young adults. *Am J Psychiatry* 2000; 157: 1584-91.
22. Pine DS, Cohen E, Cohen P, et al. Adolescent depressive symptoms as predictors of adult depression: moodiness or mood disorder? *Am J Psychiatry* 1999; 156: 133-5.
23. Rohde P, Stice E, Shaw H, et al. Effectiveness trial of an indicated cognitive-behavioral group adolescent depression prevention program versus bibliotherapy and brochure control at 1-and 2-year follow-up. *J Consult Clin Psychol* 2015; 83: 736-47.
24. Gawrysiak M, Nicholas C, Hopko DR. Behavioral activation for moderately depressed university students: Randomized controlled trial. *J Couns Psychol* 2009; 56: 468-75.
25. Bradley KL, Santor DA, Oram R. A Feasibility Trial of a Novel Approach to Depression Prevention: Targeting Proximal Risk Factors and Application of a Model of Health-Behaviour Change. *Can J Community Ment Health* 2016; 34: 47-61.
26. Shiraishi S. Daigakusei no yokutsu keiko ni taisuru shinritekikainyu no jissenkenkyu ininchiryoho niyoru yokutsukan keigen • yobo puroguramu no koka ni kansuru ichikosatsu- (Cognitive Therapy for Reducing and Preventing Depressive Moods: A Practical Study With Undergraduates.) *Japanese Journal of Educational Psychology* 2005; 53: 252-62 (in Japanese).
27. Onuigbo LN, Eseadi C, Ebifa S, et al. Effect of Rational Emotive Behavior Therapy Program on Depressive Symptoms Among University Students with Blindness in Nigeria. *J Ration Emot Cogn Behav Ther* 2018; 1-22.
28. Hayashida M, Ogawa S, Fukuhara N, et al. Korisuku daigakusei ni taisuru shudanninchikodoryoho niyoru utsubyo no ichijiyobo kainyu (Preventive Effects of Group Cognitive Behavioral Therapy on University Students with High Risk for Depression.) *Daigaku no Mentaruherusu* 2017; 1: 55-7 (in Japanese).
29. Kojima R, Fujisawa D, Tajima M, et al. Efficacy of cognitive behavioral therapy training using brief e-mail sessions in the workplace: a controlled clinical trial. *Ind Health* 2010; 48: 495-502.
30. Mori M, Tajima M, Kimura R, et al. A web-based training program using cognitive behavioral therapy to alleviate psychological distress among employees: randomized controlled pilot trial. *JMIR Res Protoc* 2014; 3: e70.
31. Kimura R, Mori M, Tajima M, et al. Effect of a brief training program based on cognitive behavioral therapy in improving work performance: A randomized controlled trial. *J Occup Health* 2015; 57: 169-78.
32. Oishi S, Takizawa T, Kamata N, et al. Web-Based Training Program Using Cognitive Behavioral Therapy to Enhance Cognitive Flexibility and Alleviate Psychological Distress Among Schoolteachers: Pilot Randomized Controlled Trial. *JMIR Res Protoc* 2018, 7: e32.
33. Haggerty RJ, Mrazek PJ. (ed.). *Reducing risks for mental disorders: Frontiers for preventive intervention research*. National Academies Press; 1994.

34. Koseirodosho utsu no ninchiryoho / ninchikodoryoho chiryosha yo manyuaru heisei 21nendo koseirodosho kokoro no kenkokagaku kenkyu jigyo "seishinryoho no jisshihoho to yukosei ni kansuru kenkyu" Retrieved from <http://www.mhlw.go.jp/bunya/shougaihoken/kokoro/dl/01.pdf>. Accessed November 1, 2018 (in Japanese).
35. Nihon jinsei tetsugaku kanjo shinri gakkai "REBT utsubyo manyuaru" henshuiinkai. REBT kenkyu bessatsu REBT utsubyo manyuaru (REBT Depression Manual). Saitama: Bunkyo Daigaku Shuppan Jigyobu; 2017 (in Japanese).
36. Dryden W. *How to Accept Yourself*. London: Sheldon Press; 1999.
37. Shima S, Shikano T, Kitamura T, et al. A new self report scale of depressive symptoms. *Seishin Igaku* 1985; 27: 717-23 (in Japanese).
38. Furukawa TA, Kawakami N, Saitoh M, et al. The performance of the Japanese version of the K6 and K10 in the World Mental Health Survey Japan. *Int J Methods Psychiatr Res* 2008; 17: 152-8.
39. Kodama M, Katayanagi H, Shimada H, et al. The associations among stress coping, automatic thought, state anxiety, and depressive symptoms in university students. *Hum Sci Res Waseda Univ* 1994; 7: 14-25 (in Japanese).
40. Mori H, Hasegawa K, Ishikuma T, et al. Development of Irrational Belief Scale (JIBT-20). *Hum Sci Res* 1994; 3: 43-58 (in Japanese).
41. Torgerson DJ, Torgerson CJ. *Designing Randomised Trials in Health, Education and the Social Sciences: An Introduction*. New York: Palgrave Macmillan; 2008.
42. Cohen J. A power primer. *Psychol Bull* 1992; 112: 155-9.