Brief report

Behavioral characteristics of subthreshold depression

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ABSTRACT

Background: This study examines differences in behavioral characteristics among individuals who are not depressed and individuals with subthreshold depression, and depression.
Methods: We conducted structured interviews with 111 undergraduate students, who also completed self-report scales. The participants were divided into a non-depression group, a subthreshold depression group, and a depression group based on results of the structured interview and the BDI-II.
Results: There were significant differences in avoidance between depression group and other two groups. Also, for the environmental rewards, there were significant difference between the non-depressed group and the other two groups.
Limitations: The sample of depressed participants was small. The overall sample consisted only under-graduate students.
Conclusions: This study reported that there are different behavioral characteristics among non-depression, subthreshold depression, and depression groups. Whereas depression group is characterized by high frequency of avoidance and low environmental rewards, subthreshold depression group is characterized by only low environmental rewards.

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1. Introduction

It has been reported that the 12-month prevalence of depression in Japan was 2.9% (Kawakami et al., 2005). Moreover, in recent years, subthreshold depression has received considerable attention (Bertha and Balazs, 2013). Subthreshold depression is defined as clinically significant depressive symptoms that do not meet diagnostic criteria for Major Depressive Disorder (MDD: Pincus et al., 1999). Subthreshold depression is known to be a risk factor for depression (Bertha and Balazs, 2013). The incidence of MDD in people with subthreshold depression is higher than in people without subthreshold depression (Cuijpers and Smit, 2004). Therefore, there is a need to investigate subthreshood depression, in addition to investigating depression.

Ferster (1973) suggested that many activities of depressed individuals are characterized by avoidance of aversive life experiences,

and a concomitant reduced frequency of positively reinforced behaviors. It has been demonstrated that clients react to depressed feelings with avoidance behaviors (Kanter et al., 2010). Moreover, several studies have reported that depressive people responded poorly to reward conditions (Henriques and Davidson, 2000). It has been suggested that depression is characterized by impairments in reinforcements processing, and that depressed patients are less able to modulate their behavior in response to reinforcements (Eshel and Roiser, 2010). As a result, depressed individuals have an increased frequency of avoidance, as well as a decrease in the degree of positive reinforcements compared to healthy people. However, no study to date has investigated the behavioral characteristics related to subthreshold depression.

The possibility of significant differences in the degrees of avoidance and positive reinforcement between subthreshold depression and depression, suggest the need to use difference behavioral interventions for depression and subthreshold depression. Therefore, the purpose of this study was to compare differences in behavioral characteristics between individuals with subthreshold depression and non-depressed, and depressed individuals.

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2. Methods

2.1. Participants

We screened 2308 freshmen BDI-II before entered Hiroshima University. Recruitment took place through email on a public information sharing center. We contacted students who had BDI-II scores greater than or equal to 10 by email. After providing informed consent, the participants were 111 (48 women, 63 men) Japanese undergraduate students. Their mean age was 18.76 yr. ($SD=.66$).

2.2. Measures

2.2.1. The Japanese version of the behavioral activation for depression scale (BADS; Takagaki et al., 2013)

The original BADS was developed by Kanter et al. (2007), and consisted of 25 items that are rated on a 7-point scale (0: Not at all to 6: Completely). The BADS consists of four subscales. The Activation subscale (BADS-AC) measures goal-directed activation and the completion of scheduled activities. The Avoidance/Rumination subscale (BADS-AR) measures the avoidance of a negative aversive state, and engaging in rumination, rather than active problem solving. The Work/School Impairment subscale (BADS-WS) measures the consequences of inactivity and passivity on work and school responsibilities. The Social Impairment (BADS-SI) subscale measures similar social consequences and social isolation. Takagaki et al. (2013) developed and demonstrated the reliability and validity of the Japanese version of the BADS.

2.2.2. The Japanese version of the environmental reward observation scale (EROS; Kunisato et al., 2011)

The original EROS was developed by Armento and Hopko (2007). The EROS consists of 10 items that are scored on a 4-point scale (1: Strongly disagree to 4: Strongly agree), and is used to measure the exposure to environmental rewards deemed essential for increasing response-contingent positive reinforcement. Kunisato et al. (2011) developed the Japanese version the EROS, and reported the reliability and validity of this scale.

2.2.3. The Japanese version of the beck depression inventory, 2nd version (BDI-II; Kojima and Furukawa, 2003)

The original BDI-II was developed by Beck et al. (1996). This scale consists of 21 self-report items that are scored on a 4-point scale, and is used to measure depressive symptoms. Kojima and Furukawa (2003) developed the Japanese version of the BDI-II and demonstrated the reliability and validity of the BDI-II.

2.2.4. Composite international diagnostic interview (CIDI; Kessler and Ustun, 2004)

The CIDI is a widely used structured interview for assessing mental disorders. We used the computerized version (Kessler and Ustun, 2004). Also each participant was assessed for their lifetime history of MDD and Bipolar Disorder (BD). We used the Japanese version of the CIDI (Kawakami et al., 2005).

2.3. Procedure

Approval for the study was obtained from the ethics committee of Hiroshima University. Recruitment took place through email on a public information sharing center. After obtaining informed consent, a trained interviewer conducted a telephone structured interview (CIDI) with each participant. We sent self-report scales to 113 participants through the Internet. The 111 participants completed self-report scales through the Internet. The collection rate of self-report scales was 98.23% in this study. Nobody met diagnostic criteria for BD in this study. Individuals who did not meet criteria for MDD in their lifetime history and who had BDI-II scores lower than 13 were allocated to the non-depressed group. Individuals who did not meet criteria for MDD in their lifetime history and who had BDI-II scores greater than or equal to 14 were allocated to the subthreshold depression group. Individuals who met diagnostic criteria for MDD in their lifetime history and who had BDI-II scores greater than or equal to 14 were allocated to the depression group. Also, we excluded individuals who met diagnostic criteria for MDD in their lifetime history and who had BDI-II scores lower than 13.

2.4. Statistical analysis

First, we reported the descriptive data. Second, ANOVAs were conducted for the behavioral characteristics data to examine differences among the three groups.

3. Results

3.1. Descriptive data for the non-depressed group, subthreshold depression group, and depression group

Based upon the telephone structured interview and the BDI-II, the participants were classified into groups: 50 participants in the non-depressed group (BDI-II=7.48); 41 in the subthreshold depression group (BDI-II=17.98); 11 in the depression group (BDI-II=21.18); 9 in the exclusion criteria (BDI-II=7.56). The mean scores on the measures are shown in Table 1. We examined whether there are significant differences of age and gender balance among three groups. The reported that there were no significant difference of age and gender balance among three groups.

3.2. Differences of behavioral factors among the three groups

Table 1 shows the mean scores and significant differences between the groups. One-way ANOVAs yielded significant differences among the non-depressed group, the subthreshold depression group, and the depression group for scores on the BADS-Total [$F(2, 99)=12.64$, $p<.01$],BADS-AR [$F(2, 99)=10.69$, $p<.01$],

Table 1
Descriptive data among three groups.

	Non-depression Group	Subthreshold Depression Group	Depression Group
	$N=50$	$N=41$	$N=11$
Female/male	19/31	16/25	8/3
Mean Age	18.80 (.67)	18.71 (.64)	18.82 (.87)
BDI-II	7.48 (3.29)	17.98 (4.97)	21.18 (7.67)
BADS-Total	99.54 (16.33) [a]	88.85 (18.56) [b]	71.46 (20.11) [c]
BADS-AC	15.30 (8.78)	13.34 (8.90)	11.46 (6.64)
BADS-AR	13.18 (7.68) [a]	17.20 (7.99) [a]	25.00 (8.91) [b]
BADS-SI	3.86 (4.54) [a]	5.59 (4.99) [a]	10.73 (7.25) [b]
BADS-WS	6.72 (4.42) [a]	9.71 (5.34) [b]	12.27 (5.43) [b]
EROS	25.88 (4.40) [a]	22.00 (4.71) [b]	20.46 (5.08) [b]

Note. Values in parentheses represent standard deviation.
There are significant difference between different shoulder alphabet(a, b, c) ($p<.05$).
BDI-II: Beck Depression Inventory –II,
BADS-Total: Behavioral Activation for Depression Scale-Total scores,
BADS-AC: Behavioral Activation for Depression Scale-Activation,
BADS-AR: Behavioral Activation for Depression Scale-Avoidance/ Rumination,
BADS-SI: Behavioral Activation for Depression Scale-Social Impairment, BADS-WS: Behavioral Activation for Depression Scale-Work/School Impairment,
EROS: Environmental Reward Observation Scale.