Temperament and character profiles of Japanese university students with depressive episodes and ideas of suicide or self-harm: A PHQ-9 screening study

Nobuyuki Mitsui[a,*], Satoshi Asakura[a,b], Yusuke Shimizu[a], Yutaka Fujii[a], Yuki Kako[a], Teruaki Tanaka[a], Koji Oba[c], Takeshi Inoue[a], Ichiro Kusumi[a]

[a]Department of Psychiatry, Hokkaido University Graduate School of Medicine, Sapporo, Japan
[b]Health care center of Hokkaido University, Sapporo, Japan
[c]Translation Research and Clinical Trial Center, Hokkaido University Hospital, Sapporo, Japan

Abstract

Objective: The aim of our study was to reveal the personality traits of individuals with major and other depressive episodes among the young adult population. Furthermore, character traits of individuals with ideas of suicide or self-harm were also investigated in this study.
Methods: The subjects of this study were 1421 university students who completed the Patient Health Questionnaire (PHQ-9) and the Temperament and Character Inventory (TCI). The subjects were divided into three separate groups: the major depressive episode group ($N = 41$), the other depressive episode group ($N = 97$), and the non-depressive controls ($N = 1283$). This separation was achieved using the PHQ-9 algorithm diagnosis. We compared the TCI scores using an analysis of variance. Moreover, the Cochran-Armitage trend test was used to determine the diagnosis, ideas of suicide or self-harm, and analysis of *character profiles*.
Results: The major depressive episode group had significantly higher HA ($P < 0.001$), lower RD ($P < 0.001$), lower SD ($P < 0.001$), and lower C ($P < 0.001$) scores than non-depressive controls. The other depressive episode group had significantly higher HA scores ($P < 0.001$) and lower SD scores ($P < 0.001$) than non-depressive controls. The Cochran-Armitage trend test revealed that the prevalence of depressive episodes decreased as the character profiles matured ($\chi^2_{trend} = 57.2$, $P < 0.0001$). The same tendency was observed in individuals who had ideas of suicide or self-harm ($\chi^2_{trend} = 49.3$, $P < 0.0001$).
Conclusion: High HA and low SD scores were common personality traits among young adults with major depressive episodes. Furthermore, the immaturity of *character profiles* was clearly associated with depressive episodes and ideas of suicide or self-harm.
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1. Introduction

Kessler et al. reported that the highest risk of initial suicide ideation, planning, and attempts took place during an individual's late teens to early 20s [1]. Accordingly, it is very important to study depression and ideas of suicide or self-harm in young adults to prevent suicide. Several studies have examined the pathogenic and predictive role of personality in depressive symptoms among the young adult population using the Temperament and Character Inventory (TCI) [2–5]. The TCI is a widely used self-rating scale for assessing personality among adult samples. The TCI consists of four dimensions of temperament [i.e., novelty seeking (NS), harm avoidance (HA), reward dependence (RD), and persistence (P)] and three dimensions of character [i.e., self-directedness (SD), cooperativeness (C), and self-transcendence (ST)].

Among the four temperament dimensions, high HA scores were consistently associated with depressive symptoms in both clinical samples and general populations [6]. Recently, Kampman et al. reviewed 12 studies that focused on the relationship between TCI temperament dimensions and depressive symptoms. He concluded that high HA scores were associated with both current depressive symptoms and a depressive trait [6]. Four recent studies, comprised of young adult participants, also demonstrated the correlation

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between depressive symptoms and HA scores [2–5]. In these studies, the Beck Depression Inventory (BDI), Self-Rating Depression Scale (SDS), and the Hospital Anxiety and Depression Scale (HADS) were used to evaluate depressive symptoms. These instruments can be used as continuous measures of depression severity, but they cannot make a criteria-based diagnosis of depression. Therefore, it is difficult to differentiate threshold and sub-threshold depressive episodes, i.e., major and minor depressive episodes, using the BDI, SDS, and HADS. Hence, these previous studies did not properly judge the temperaments of individuals with major depressive episodes among the young adult population. Moreover, the relationship between minor depressive disorder and personality has yet to be reported. Although minor depressive disorder is thought to be a risk factor for developing major depressive disorder [7–9], the personality traits of minor depressive disorder have not been made clear.

Concerning *character profiles*, several previous studies conducted in clinical settings [10,11] have reported that depressive symptoms are associated with character immaturity. This character immaturity was indicated by the presence of low SD and low C scores [12]. In a general adult sample, depressive symptoms are often observed in individuals who have an immature *character profile* [13]. Moreover, a low SD score was suggested as one of the predictors of vulnerability to a future major depressive disorder [14]. Focusing on the young adult population, previous studies reported that SD scores are negatively correlated with depressive symptoms [2–5]. The other character dimensions, C [2–4] and ST [2], are also negatively correlated with depressive symptoms. Cloninger et al. proposed eight *character profiles* based on eight possible configurations of high or low scores of SD, C, and ST [15]. For example, the *character profile* that includes low scores in three different character dimensions will most likely embody a depressive personality. The melancholic *character profile* is the most common in depression [15]. Although the link between character immaturity and depression is anticipated among the young adult population, the prevalence of depressive episodes among young adults who fit one of Cloninger's eight *character profiles* has not yet been reported. Another reason for major depressive episode screening among the general population is the early detection of individuals with a high suicide risk. Few studies, at least among the young adult population, have analyzed the association between personality and ideas of suicide or self-harm. According to clinical studies, individuals who had previously attempted suicide [16,17] and had suicidal thoughts, [16] along with depression, showed high HA scores and low SD scores. Our recent study demonstrated that young adults who completed suicide consistently had high HA scores [18]. The association between ideas of suicide or self-harm and *character profiles* has not yet been studied among the young adult population.

This study aims to verify a number of hypotheses regarding young adults. First, young adults with major depressive episodes have higher HA scores and lower SD scores than did non-depressive controls. Second, young adults with other depressive episodes defined by the PHQ-9 also have higher HA scores and lower SD scores than non-depressive controls. Third, major or other depressive episodes are more often observed in individuals with low SD scores and low C *character profiles* than those with high SD scores and high C *character profiles*. Fourth, ideas of suicide or self-harm are more often observed in individuals with low SD scores and low C *character profiles* than those with high SD scores and high C *character profiles*. To screen for major and other depressive episodes and ideas of suicide or self-harm and to study the relationship between these disorders and personality, we administered the PHQ-9, a self-report questionnaire, and TCI to university students. Though the PHQ-9 requires less than 1 minute for patients to complete, it is as good a screener for major depression as longer instruments in various settings, countries, and populations, and has a validity for measuring its severity [19–21].

2. Methods

2.1. Subjects

The PHQ-9 and TCI were administered to 2117 university students who enrolled in Hokkaido University in April 2010. Both self-rating scales were completed by 1421 students (67.1%). We defined these 1421 students as the "subjects" of our study. According to the PHQ-9 algorithm diagnosis, 41 (2.9%) were classified as having a major depressive episode, 97 (6.8%) were classified as having other depressive episodes, and 1283 (90.3%) were classified as non-depressive controls (NC).

Written informed consent was obtained from all subjects prior to completion of the TCI and PHQ-9. This study was approved by the Ethical Committee of Hokkaido University Graduate School of Medicine and was conducted in accordance with the ethical standards established in the 1964 Declaration of Helsinki (amended in Seoul, October 2008).

2.2. Measures

2.2.1. PHQ-9

The PHQ was developed as a self-report version of the Primary Care Evaluation of Mental Disorders (PRIME-MD). It was designed for the criteria-based diagnosis of several mental disorders commonly observed in primary care [19]. The validity of the depression module (PHQ-9) of the PHQ for screening major depressive episodes was confirmed in primary care, medical outpatient services and specialist medical services [20,22]. Two recent meta-analyses have reliable sensitivity numbers (0.80 and 0.77, respectively) and specificity data (0.92 and 0.94, respectively) for the PHQ-9. These numbers correspond with the DSM-IV diagnosis of major depressive disorder or major depressive episodes in primary care clinics and non-psychiatric clinics [20,22]. In this study, we used the Japanese version of the PHQ-9. The