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Title Page

The Social Anxiety / *Taijin-kyofu* Scale (SATS): Development and Psychometric Evaluation of a New Instrument

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Key Words: Social anxiety; *Taijin-kyofu*; Body dysmorphic disorder; Rating scale; Reliability; Validity

Abstract

Background: *Taijin-kyofu* (TK), especially the 'convinced' subtype of TK (c-TK; also known as the offensive subtype of TK), is described as a Japanese culture-bound syndrome similar to social anxiety disorder (SAD). Recently, in Western countries, the symptoms of c-TK have been investigated in patients with SAD. We developed the Social Anxiety / *Taijin-kyofu* Scale (SATS), a 12-item, structured, clinician-rated instrument designed to rate the severity of TK symptoms, and examined its reliability and validity.

Methods: The SATS was administered to fifteen patients with c-TK diagnosed using the traditional Japanese TK criteria. Interviews used to score patients' symptoms were recorded on videotape. Additionally, the Clinical Global Impression-Severity Scale (CGI-S) was administered to assess convergent validity. Interrater reliability was assessed on 15 videotaped interviews; the interviews were independently rated by ten other raters. Test-retest reliability was assessed on 15 videotaped interviews by the same rater at an interval of more than four weeks.

Results: The SATS had high internal consistency (Cronbach's $\alpha = 0.97$), and good interrater reliability (ICC = 0.88 ~ 0.93) and test-retest reliability (ICC = 0.94 ~ 0.99). The SATS total score correlated with the CGI-S sores ($r = 0.77$, $p < 0.0001$).

Conclusion: The SATS appears to be a reliable and valid measure of the symptoms of TK.

Introduction

Taijin-kyofu (TK) is a Japanese syndrome characterized by interpersonal sensitivity, fear of and avoidance of interpersonal situations [1, 2]. In Japanese, "*taijin*" means "interpersonal" and "*kyofu*" means "fear". TK is often considered a form of social anxiety that is specific to Japanese and East Asian cultures, and it is classified as a culture-bound syndrome in the DSM-IV [3]. The DSM-IV emphasizes "an individual's intense fear that his or her body, its parts or its functions, displease, embarrass, or are offensive to other people in appearance, as well as odor, facial expressions, or movements".

TK is a broader concept in Japan than social anxiety disorder (SAD) as defined in the DSM-IV, and has two subtypes: one is a 'sensitive' subtype of TK (s-TK) that corresponds to SAD, based on the DSM-IV; the other is a 'convinced' subtype of TK (c-TK; also known as an 'offensive' subtype of TK)(fig. 1). The common characteristics of c-TK are that (1) there is a firm belief in the existence of serious shortcomings concerning oneself such as unpleasant body odor, inadequate eye expression, perceived physical defects, or stiff facial expression, (2) the existence of these shortcomings is intuitively perceived by patients from the behavior and actions of others around them, (3) these defects are perceived to make others feel unpleasant and therefore must be corrected or removed by all means, (4) no other symptoms appear during a long follow-up period [2]. The c-TK subtype may be diagnosed as body dysmorphic disorder (BDD) or delusional disorder, somatic type based on the DSM-IV criteria and partly reported as olfactory reference syndrome [4, 5]. On the relationship between SAD and BDD, BDD has been found to be the fourth most common comorbid disorder in patients with SAD [6], and estimates of the point prevalence of BDD in patients with SAD range from 8% [7] to 12% [8]. In patients with BDD, the point prevalence of

comorbid SAD ranges from 16% [9] to 69% [7], with the largest study (N=293) finding a lifetime prevalence of 37% and current prevalence of 31% [10]. Coles and colleagues [11] pointed out that 39.3% of 178 individuals with current BDD had comorbid lifelong SAD and suggested that Eastern perspectives of BDD as a form of SAD (or a " SAD spectrum disorder") are worthy of increased attention in the West. Recently, in Western countries, symptoms of c-TK have been investigated in patients with SAD [12-14].

Selective serotonin reuptake inhibitors (SSRIs) and serotonin-noradrenaline reuptake inhibitor (SNRI) have been shown to be efficacious for SAD in a number of double-blind, placebo-controlled studies [15-21]. There are reports on the efficacy of SSRIs and SNRI for BDD and the delusional variant of BDD (delusional disorder, somatic type) [22-25]. In addition, preliminary studies [12, 26-28] suggest that SSRIs and SNRI may be effective for the treatment of c-TK. Given the suggestion of consistent pharmacologic responsiveness for SAD, BDD and c-TK, it may be valuable to expand the current DSM diagnostic criteria for SAD to incorporate symptoms of c-TK. Such criteria would make it possible to investigate whether c-TK is culture-bound or found more broadly across the world.

The Liebowitz Social Anxiety Scale (LSAS) [29] is a reliable, valid, and widely used scale that is the standard measure of SAD severity. The LSAS, a clinician-rated, 24-item scale, was designed to assess the range of social interaction and performance situations that individuals with SAD may fear and/or avoid. The LSAS-Japanese version (LSAS-J) [30] was used in the clinical study of SAD in Japan [21]. However, investigation of TK — in particular, assessment of severity — has been hampered by the lack of a measure for the assessment of c-TK symptoms in the LSAS. The Yale Brown Obsessive Compulsive Scale Modified for BDD (BDD-YBOCS) [31], a 12-item semi-structured clinician-rated scale, was developed to rate the severity of BDD. The BDD-YBOCS

assesses obsessional preoccupation with a perceived defect in appearance, compulsive behaviors, insight, and avoidance, but does not assess social anxiety symptoms. Recently, the Taijin-Kyoufu-Sho Questionnaire (TKSQ) [13], a 30-item questionnaire, was developed to assess TK features including symptoms of c-TK. Ten physical/behavioral symptoms characteristic of TK and/or SAD are rated in respect of the severity of fear associated with each of three interpersonal foci: (1) embarrassing oneself, (2) making another person uncomfortable, (3) offending another person. Five of the 10 symptoms in the TKSQ are hypothesized to be specific to c-TK (fears of a stiff facial expression, body odor, inappropriate staring, internal gas, and physical appearance), here referred to as the c-TK symptoms, and the other five are hypothesized to be common to both SAD and TK (fears of blushing, body trembling, voice trembling, sweating, and making eye contact), here referred to as common symptoms. However, although TKSQ is a useful questionnaire, it does not assess the severity of the common cognitive symptoms of c-TK such as the degree of the conviction about the existence of serious shortcomings concerning oneself, and of the idea of reference that the existence of these shortcomings is intuitively perceived by patients from the behavior and actions of others around them.

We thus developed the Social Anxiety / *Taijin-kyofu* Scale (SATS), a 12-item, structured, clinician-rated instrument designed to rate the severity of the symptoms of TK. This article reports the reliability and validity of the SATS.

Materials and Methods

Scale Development and Description

The SATS was developed using a model based on the Yale-Brown Obsessive Compulsive Scale

(Y-BOCS) [32, 33] that was used to develop the Panic Disorder Severity Scale (PDSS) [34] and Generalized Anxiety Disorder Severity Scale (GADSS) [35]. The SATS was not designed to diagnose the presence or absence of the syndrome of TK. The SATS begins with a symptoms checklist to identify situations that are the focus of fear or anxiety and avoidance. Examples include speaking in front of an audience; speaking up at meetings to share opinions; expressing disagreement with someone; talking to people with more authority; talking to people of the opposite sex; inviting people out; making eye contact when talking to someone; attending social gatherings with many unfamiliar people; participating in small group activities or events; entering a room in which other people are gathered; being watched while working or studying; being watched while writing something; eating or drinking in a public place; making phone calls to persons with whom one is not very well acquainted; answering telephone calls; being the center of attention; or using public transportation with other passengers on board. The checklist also aims to identify cognitive symptoms of c-TK: that body odor, eye expression, appearance, or facial expression make others uncomfortable and that these shortcomings are intuitively perceived by patients from the behavior and actions of others around them. The list of situations was based on the LSAS, and the list of cognitive symptoms of c-TK was based on the descriptions of TK by Kasahara [36], Lee [37], Russell [38], Takahashi [39], Yamashita [2], and the authors' experience with TK. The symptom checklist is used to clarify the target symptoms for accurate evaluation of the severity of TK. The SATS (supplement) had three categories and 12 items. Category 1 (items 1-1 through 1-4), which assesses fear or anxiety and related physical symptoms (e.g. trembling, blushing, sweating, palpitation, nausea), contains the degree of anticipatory anxiety, distress associated with fear or anxiety, resistance against fear or anxiety and physical symptoms associated with fear or anxiety. Category 2 (items 2-1 through 2-4), which assesses avoidance behavior, contains the degree of

avoidance behavior, distress associated with avoidance behavior, resistance against avoidance behavior and social interference caused by avoidance behavior. Category 3 (items 3-1 through 3-4), which assesses the cognitive symptoms of c-TK, contains the degree of conviction, idea of reference, offensiveness and distress associated with cognitive symptoms. TK is a concept related to SAD and BDD. The categories of fear or anxiety and avoidance behavior are components that are as important in the assessment of TK as in that of SAD [2, 40]. In the BDD-YBOCS, distress, resistance and interference are equally assessed by the two categories of obsession and compulsion. In the SATS, however, distress, which is derived from the components belonging to all categories, is assessed by three categories. Regarding resistance, because it is to be regarded as related to the degree of conviction in c-TK's cognitive symptoms category [2, 36, 37, 39, 49], it is assessed by the two categories of fear or anxiety and avoidance behavior. Because social interference is often derived from avoidance behavior, it is assessed by one category. Like the Y-BOCS, the SATS has specific probes and five anchors for each item, with descriptions corresponding to each anchor. The score for each item ranges from 0 (no symptoms) to 4 (extreme symptoms). The total SATS score is the sum of 12 items (range = 0 to 48). Each item is rated as a composite of all of the patient's appearance-related fear or anxiety and related physical symptoms, avoidance behaviors and cognitive symptoms, independent of their content during the past week. Because the SATS is a 3-category and 12-item scale and each of its items is equipped with the structured interview manual, which can be assessed by fewer than 4 or 5 questions, it is relatively easy to assess it. The full manual for the SATS can be obtained from the first author.

Study Participants and Procedures

This study was carried out in the Department of Psychiatry, Hokkaido University Hospital and the

Department of Psychiatry, Health Care Center of Hokkaido University.

Fifteen patients (one inpatient and 14 outpatients; nine men and six women, mean age (SD) 24.8 years (6.6)) who met the traditional diagnostic criteria for c-TK (table 1) [40] gave signed informed consent for videotaped interviews. None of the patients had other comorbid psychiatric disorders (e.g. schizophrenia, bipolar disorder, major depressive disorder, panic disorder, alcohol abuse/dependence), or medical or neurological disorders. Interviews in which patients' symptoms were scored were recorded by videotape.

Interrater reliability was assessed on 15 videotaped interviews; the interviews were independently rated by ten other raters, each of whom had more than seven years of clinical experience as a research psychiatrist. All raters were trained in the use of the SATS before starting the study. All scoring was done blind to the other interviewers' ratings. The SATS is a structured interview. Consequently, it is suggested that if separate raters independently evaluate what was videotaped, then they might obtain results similar to those obtained using the method by which, when one rater interviews and evaluates a subject, separate raters are present in the same room and they independently evaluate the subject. The interrater reliability by videotaped interview method is also used in the Y-BOCS and the structured interview guide for the Hamilton Anxiety Rating Scale (SIGH-A) [41]. In all, 150 assessments were conducted by the videotaped interview method, in which 10 raters examined 15 subjects. Test-retest reliability was assessed in 15 videotaped interviews by the same rater at an interval of more than 4 weeks. To assess convergent validity, the SATS interviewer administered the Clinical Global Impression-Severity Scale (CGI-S).

This study was approved by the Institutional Ethics Committee of the School of Medicine, Hokkaido University.

Statistical Analysis

Internal consistency of the SATS was assessed using Cronbach's α coefficient. Spearman's correlation was used between the SATS total score and the individual subtotal scores. Intraclass correlation coefficient (ICC) was used to determine interrater reliability and test-retest reliability. Spearman's correlation was used between the SATS and CGI-S.

Results

Cronbach's α coefficient for the SATS was found to be 0.97, indicating excellent internal consistency (table 2). Cronbach's α calculated for the individual subtotal score was 0.75 for the fear or anxiety and related physical symptoms subtotal score, 0.78 for the avoidance behavior subtotal score, and 0.72 for the cognitive symptoms subtotal score. The SATS total score was highly correlated with fear or anxiety and the related physical symptoms subtotal score ($r=0.85$, $p<0.0001$), the avoidance behavior subtotal score ($r=0.93$, $p<0.0001$), and the cognitive symptoms subtotal score ($r=0.79$, $p=0.0005$).

ICC demonstrated excellent interrater reliability across the ten raters for the total score, subtotal scores and scores for each item (table 3). Test-retest reliability over an interval of more than 4 weeks assessed by ICC was 0.99 for the total score, 0.93 for the fear or anxiety and related physical symptoms subtotal score, 0.99 for the avoidance behavior subtotal score, and 0.98 for the cognitive symptoms subtotal score.

The total score, the fear or anxiety and related physical symptoms subtotal score, the avoidance behavior subtotal score and the cognitive symptoms subtotal score on the SATS were significantly correlated with the global measure of illness severity; they were positively correlated with the

CGI-S score ($r=0.77$, $p<0.0001$; $r=0.60$, $p=0.001$; $r=0.71$, $p<0.0001$; $r=0.82$, $p<0.0001$, respectively).

Discussion

This study describes the psychometric characteristics of a new clinician-rated measure to assess the severity of the TK symptoms in patients with c-TK. Findings suggest that the SATS is a reliable and valid instrument for assessing TK. The SATS scores had good internal consistency for the total score as well as the subtotal scores. In addition, the SATS demonstrated excellent interrater reliability and test-retest reliability. The videotaped interview method may have contributed to the findings of high interrater reliability and test-retest agreement, but is unlikely to have fully accounted for the magnitude of these results.

All three subtotal scores correlated with the SATS total score. Evidence for the convergent validity of the SATS was derived from its correlation with the CGI-S score. However, other severity measures of TK were lacking, and expert clinician judgment is often used as the gold standard in psychiatry.

A chart review of 48 patients with c-TK reported a 48% response rate to treatment with clomipramine or fluvoxamine [26]; an open-label trial reported that six of 11 patients diagnosed with c-TK responded to milnacipran [27], and a recent open-label trial reported that 41% of 19 patients diagnosed with c-TK responded to paroxetine [28]. These preliminary SSRIs and SNRI studies only used the CGI-Global Improvement Scale and/or the *Taijin-kyofusho* (TKS) offensive anxiety scale (0-3 points), the validity of which was not examined systematically for the evaluation of c-TK symptoms. The SATS is a reliable and valid instrument that could prove useful for study of

the treatment of TK.

The SATS is not constructed as a symptom inventory, like the Y-BOCS, and is therefore not particularly biased in favor of c-TK symptoms (fear of body odor, eye expression, physical appearance, facial expression). The focus of the ratings generated by the SATS is on form rather than content; the SATS measures the net effect of the fear or anxiety and related physical symptoms, avoidance behavior and cognitive symptoms, not what they are about. Current fear or anxiety and related physical symptoms, avoidance behavior and cognitive symptoms are organized into a list of target symptoms as a way of establishing a symptom profile for the patient. However, it is the composite effect of these symptoms that determines the severity ratings on the SATS. This approach also endows the SATS with sufficient flexibility to permit its use in rating the severity of disorders related to TK. For example, based on the DSM-IV criteria, SAD, BDD and 'delusional disorder, somatic type' could conceivably be rated with the SATS. The SATS might also be useful in examining whether c-TK symptoms are culture-bound or not.

The present study is limited in several ways. First, we did not assess discriminate validity in relationship to other anxiety disorders, other psychiatric disorders, and healthy subjects. These must be examined in separate, future studies. Second, we do not have information on the sensitivity to change with treatment. Treatment studies are needed to determine the responsiveness of the SATS in assessing change across time. Third, this study was of a relatively small sample of subjects who presented to our two University-based clinics. The subjects we recruited were similar to those who come to these settings, as they had a range of diagnoses and severity. In addition, all raters in this study had prior experience as researchers into TK; we do not know whether untrained raters would achieve similar levels of reliability using the instrument.

Conclusion

The SATS, a 12-item structured clinician-rated instrument, appears to be a reliable and valid measure of the severity of TK. The studies of TK should be devoted to clarify the relationship between SAD and BDD.

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Fig. 1.

Relationship between the traditional diagnosis of *Taijin-kyofu* (TK) in Japan and the DSM-IV diagnosis. The sensitive subtype of TK corresponds to social anxiety disorder and the convinced subtype of TK (also known as the offensive subtype of TK) may be diagnosed as body dysmorphic disorder (BDD) or delusional disorder, somatic type (delusional variant of BDD) based on the DSM-IV.

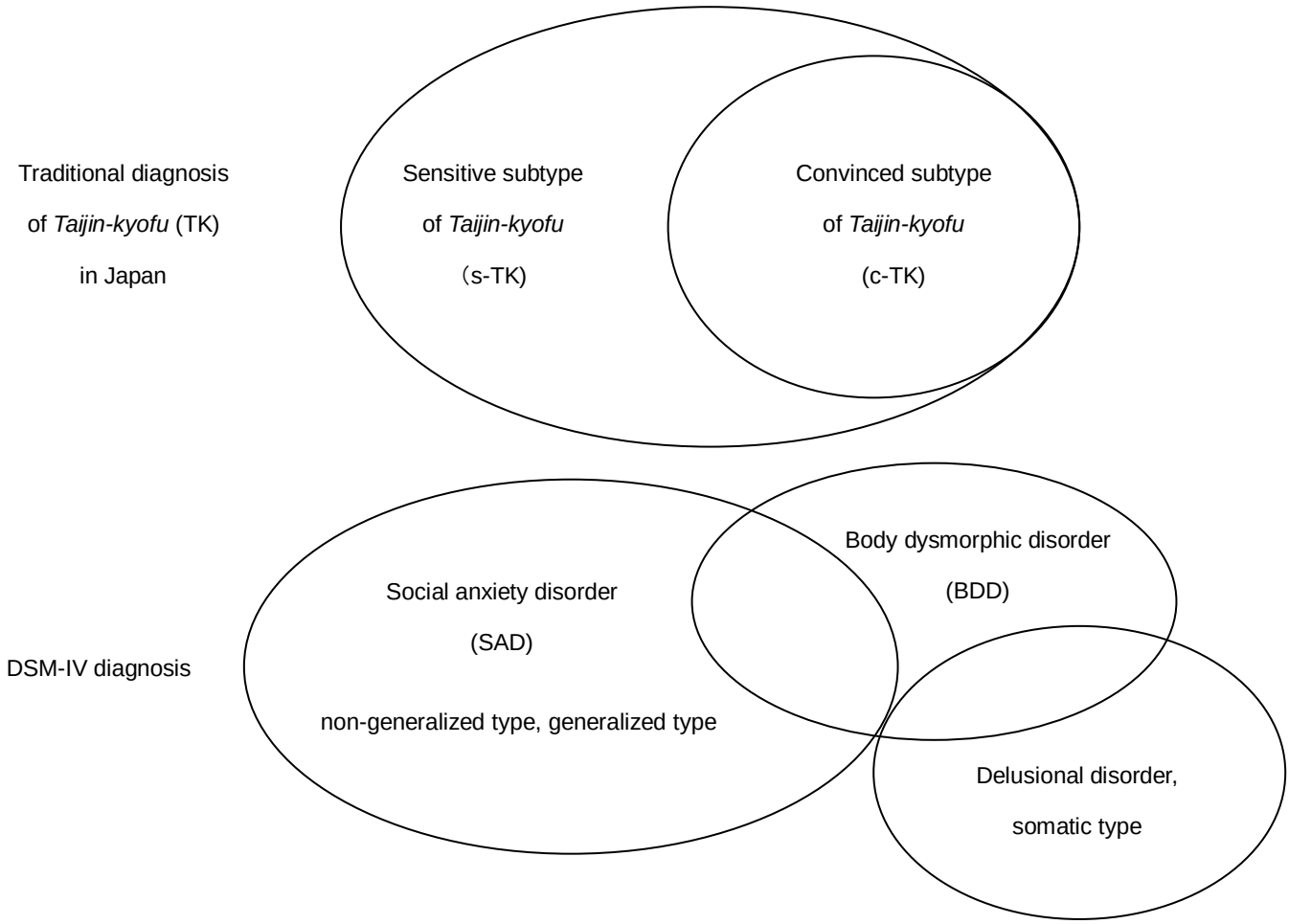

Traditional diagnosis
of *Taijin-kyofu* (TK)
in Japan
Sensitive subtype
of *Taijin-kyofu*
（s-TK)
Convinced subtype
of *Taijin-kyofu*
(c-TK)
DSM-IV diagnosis
Social anxiety disorder
(SAD)
non-generalized type, generalized type
Body dysmorphic disorder
(BDD)
Delusional disorder,
somatic type

Fig.

Table 1. Traditional diagnostic criteria for *Taijin-kyofu* (TK) in Japan

Taijin-kyofu (TK) is a condition in which:

1) The individual feels that his/her own attitudes, behaviors, and physical characteristics are inadequate in social situations;
2) Because of these feelings, the individual suffers persistently from emotional reactions, such as shame, embarrassment, anxiety, fear, and is scared and tense in social situations;
3) Due to conditions 1) and 2), the individual feels worried that he/she is unable to maintain healthy relationships with others, and he/she may feel unacceptable, despised, and avoided;
4) While the individual attempts to avoid painful social and interpersonal situations, he/she feels reluctant to do so.

Individuals who fulfill only criteria 1) to 4) are called the "sensitive subtype of TK (s-TK)"

In addition to the above conditions, individuals with the following characteristics are called the "convinced subtype of TK (c-TK)"

1) The individual feels certain that he/she has a defect in a particular body part or physical characteristics, such as the eyes, body odor, or appearance;
2) Due to condition 1), the individual has a conviction that he/she harms other people or gives others unpleasant feelings;
3) Also due to condition 1), the individual has a conviction that others always avoid him/her.

Table 2. Cronbach's α coefficients for the Social Anxiety/*Taijin-kyoufu* Scale (SATS) and subscales (n = 15)

Scale	Cronbach's α
SATS total score	0.97
Fear or anxiety and related physical symptoms subtotal score	0.75
Avoidance behavior subtotal score	0.78
Cognitive symptoms subtotal score	0.72

Table 3. Intraclass correlation coefficient (ICC) for the Social Anxiety/*Taijin-kyofu* Scale (SATS) for ten raters (n = 15)

Scale	ICC	95%CI
SATS total score	0.93	0.88-0.97
Fear or anxiety and related physical symptoms subtotal score	0.92	0.85-0.97
degree of anticipatory anxiety	0.82	0.70-0.92
distress associated with fear or anxiety	0.92	0.85-0.97
resistance against fear or anxiety	0.90	0.82-0.96
physical symptoms associated with fear or anxiety	0.88	0.78-0.95
Avoidance behavior subtotal score	0.94	0.89-0.98
degree of avoidance behavior	0.95	0.91-0.98
distress associated with avoidance behavior	0.90	0.82-0.96
resistance against avoidance behavior	0.94	0.89-0.98
social interference caused by avoidance behavior	0.86	0.75-0.94
Cognitive symptoms subtotal score	0.88	0.79-0.95
degree of conviction	0.84	0.72-0.93
idea of reference	0.81	0.68-0.92
offensiveness	0.86	0.76-0.95
distress associated with cognitive symptoms	0.88	0.79-0.95