

Validity of the Subjective Units of Disturbance Scale in EMDR

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To test the psychometric properties of the Subjective Units of Disturbance Scale (SUDS), this study analyzed the data from 61 patients treated with EMDR. The pretreatment self-reported questionnaires, the in-session records of EMDR, and the Clinical Global Impression–Change (CGI-C) scale at the termination of EMDR were reviewed. The initial score of the SUDS at the first session was significantly correlated with the patient's level of depression, the state anxiety, and distress from the impact of events. The final score of the SUDS at the first session was significantly correlated with the CGI-C score at termination. Consequently, this study confirmed that the SUDS in EMDR sessions has good psychometric properties.

Keywords: EMDR; Subjective Units Disturbance Scale (SUDS); validity

Assessing the level of subjective anxiety is an important procedural element in behavior therapy. A simple check enables clinicians to anchor clients' self-rated discomfort at baseline, to monitor any change of their status, and also to evaluate the progress of therapy (Ciminero, Nelson, & Lipinski, 1977; Sloan & Mizes, 1999; Wolpe, 1990). For this reason, the behavioral therapist Joseph Wolpe (1969) developed and introduced the Subjective Units of Disturbance Scale (SUDS). Since then, this instrument has been extensively used in the realm of behavior treatment, and is sometimes referred to as the Subjective Units of Distress Scale.

The SUDS is a one-item 11-point Likert-type subjective anxiety scale. Originally, it was defined as the self-rated current anxiety between 0 (a state of absolute calmness) and 100 (the worst anxiety ever experienced; Wolpe, 1969). Later, Wolpe (1990) also proposed the use of a more compact scale ranging from 0 to 10. The SUDS was not only used for measuring anxiety in exposure-based therapies (e.g., prolonged exposure; Foa & Rothbaum, 1998) but also adapted for describing subjective alcohol urges (Hodgson & Rankin, 1976) and even the subjective level of sexual arousal (Farkas, Sine, & Evans, 1979).

Francine Shapiro (1995), the originator and developer of eye movement desensitization and reprocessing (EMDR), incorporated the SUDS into the standard

treatment protocol. Additionally, the range of emotion that the scale covers was expanded from subjective anxiety alone to any emotional disturbance or negative feelings. In EMDR, the SUDS is designed to measure the level of distress before and after target memory processing. The therapist checks the initial SUDS score of the target traumatic memory during the assessment phase and then rechecks it to evaluate changes at the end of desensitization. In practice, checking the SUDS during the EMDR procedure does more than just provide a quantitative index of progress; it also fosters a sense of accomplishment in clients and helps clinicians evaluate blocks and goals of reprocessing (Shapiro, 1995). In fact, the SUDS serves as an important tool for therapists in the evaluation of treatment processes and is also a valuable source of information about what is happening during reprocessing in their clients.

However, the simple scale used in EMDR has been criticized for its lack of reliability and validity (DeBell & Jones, 1997) and lack of validity as an accurate measurement of a treatment outcome (Lohr et al., 1992). The authors were able to locate only two studies reporting validity of the SUDS in experimental conditions. Thyer, Papsdorf, Davis, and Vallecorsa (1984) reported a significant correlation between the scores on the SUDS with autonomic indices of anxiety (i.e., heart rate and hand temperature). Likewise, Kaplan,

Smith, and Coons (1995) confirmed the concurrent validity of the SUDS with current or state anxiety. However, these were not treatment studies, and despite its wide use in many disciplines of psychotherapy, to our knowledge, the psychometric properties of the SUDS in treatment have not yet been studied. To test the psychometric properties of the SUDS, this study analyzed data from 61 patients who received EMDR at a trauma clinic of a university-affiliated teaching hospital.

Method

Participants

The self-reported psychometric data completed by 61 consecutive adult patients within the week before the start of EMDR were analyzed. The clinical and demographic data were supplemented from their medical records, and the treatment variables were taken from session records of the EMDR. The clinical setting was a specialized trauma clinic at a university-affiliated teaching hospital, and most patients received treatment there following clinical referrals.

The most common diagnosis was posttraumatic stress disorder (PTSD; 55%), followed by a major depressive disorder (20%), other anxiety disorder (8%), and others (16%). Diagnoses were given when patients fully met criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994). Diagnoses of PTSD also required a score of at least 45 on the Clinician Administered PTSD Scale (Blake et al., 1995). Their most common index traumas were physical or criminal assaults (31%), life-threatening accidents (26%), sexual assault or abuse (23%), traumatic loss (7%), others (3%), and no trauma (10%). Participants had a mean age of 30.2 years ($SD = 8.9$). They were mostly women (68%), with education beyond high school graduation (84%), unmarried (61%), employed (67%), and currently taking psychiatric medication (63%).

Treatment Provision

The participants received a mean of 4.6 sessions ($SD = 3.4$, range 1–21) of EMDR provided by the first author (DK). He had completed parts 1 and 2 training with the EMDR Institute and had practiced EMDR for a year before the initiation of this study. This study was approved by the Institutional Research Ethics Board of Hanyang University Hospital of Guri.

Measurement

Symptom Checklist-90-Revised. The Symptom Checklist-90-Revised (SCL-90-R) is a self-administered 90-item

multidimensional questionnaire designed to measure a broad range of psychopathological symptoms. Its 12 subscales include nine symptom dimensions and three global indices (Derogatis, Rickels, & Rock, 1976; Kim & Kim, 1984). In this study, one of the global indices, the Positive Symptom Distress Index (PSDI), which reflects the severity of symptomatic distress, was used for testing the concurrent validity of the SUDS.

Impact of Event Scale–Revised. The Impact of Event Scale–Revised (IES-R) is a 22-item self-rating questionnaire that reflects *DSM-IV*-designated symptoms of posttraumatic stress disorder (PTSD), categorized as three subscale clusters: intrusion, avoidance, and hyperarousal (Eun et al., 2005; Weiss & Marmar, 1997). Respondents in this study were asked to focus on their index trauma or a stressful event that caused them to seek psychiatric treatment.

Beck Depression Inventory. The Beck Depression Inventory (BDI) is a widely used self-rating tool for measuring depressive symptomatology. The scale has 21 items and asks respondents about various depressive symptoms during the previous week (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961; Lee & Song, 1991).

State and Trait Anxiety Inventory. The self-rated State and Trait Anxiety Inventory (STAI) has two separate components, the State Anxiety Inventory (SAI) and the Trait Anxiety Inventory (TAI), both of which are made up of 20 items (Kim, 1978; Spielberger, Gorsuch, & Lushene, 1970). The SAI measures how a person feels at the present time, while the TAI assesses a person's general disposition for anxiety.

Clinical Global Impression–Change Scale. The Clinical Global Impression–Change scale (CGI-C) is a clinician-rated 7-point scale of global evaluation that assesses the change in the degree of illness in relation to the original assessment (Guy, 1976). The therapist himself (DK) scored patients from “very much improved = 1” to “very much worse = 7” at the termination of EMDR.

Procedures

Convergent and Discriminant Validity. Convergent validity is the extent to which a measure correlates with other theoretically related constructs. In contrast, discriminant validity is established when the measure does not correlate with constructs that are theoretically dissimilar. A correlation between the initial scores of the SUDS and current state anxiety/depression was evaluated to assess the convergent

validity, and correlation with general trait anxiety and demographic factors was assessed for the discriminant validity.

Predictive Validity. Predictive validity is the ability of an instrument to predict a future score on a theoretically related measure. To evaluate predictive validity, the authors studied the correlation between the final scores of the SUDS at the first session and the CGI-C values measured at the termination of therapy (last observation carried forward: LOCF). It was decided to use the SUDS rating at the end of the session rather than the initial SUDS score because the score at session end was reflective of the patient's response to treatment during the first session.

Concurrent Validity. Concurrent validity is assessed when a test correlates with a previous established and validated measure. The SUDS concurrent validity with IES-R and with the PSDI were assessed to determine its ability to predict responses on a measure assessing distress related to an index event (the IES-R) and general subjective distress related not only to the index trauma but also to other targets (the PSDI). These two scales were chosen because the authors thought they represented the best approximation of the construct of the SUDS as it is used in EMDR.

Statistical Analysis

Because some variables, including the SUDS, and some scales violated the rule of normal distribution, analyses were done using nonparametric tests (e.g., Spearman correlation).

Results

Pretreatment Scores

There were significant intercorrelations among the self-reported measures taken at pretreatment (see Table 1). These findings suggest that the constructs measured by these inventories may be related and not independent constructs.

SUDS Scores

The mean SUDS score at the beginning of the first session was 7.86 ($SD = 2.07$), while at the end of the first session, the mean score was 5.61 ($SD = 3.23$). Likewise, the mean scores at the beginning and end of the second session were 7.18 ($SD = 2.26$) and 4.34 ($SD = 2.91$), respectively. The mean scores for the third session were 8.24 ($SD = 1.62$) and 4.51 ($SD = 2.83$), respectively. Table 1 shows that the SUDS score at the end of the first session significantly correlated with

TABLE 1. Intercorrelations Between Scores of Scales and Subjective Units of Distress Scale (SUDS)

	CGI-C	Initial SUDS Session 1	Final SUDS Session 1	Initial SUDS Session 2	Final SUDS Session 2	Initial SUDS Session 3	Final SUDS Session 3	BDI	SAI	TAI	PSDI
CGI-C											
Initial SUDS Session 1	.114										
Final SUDS Session 1	.317*	.421**									
Initial SUDS Session 2	.149	.327*	.323*								
Final SUDS Session 2	.275	.288*	.511***	.467***							
Initial SUDS Session 3	.159	.233	.129	.092	.217						
Final SUDS Session 3	.369*	.108	.606***	.169	.431**	.401*					
BDI	.186	.281*	.368**	.172	.229	.043	.124				
SAI	.124	.314*	.363**	.206	.060	.072	.098	.736***			
TAI	.298*	.206	.341*	.261	.100	.041	.012	.565***	.593***		
PSDI	.134	.502***	.255	.265	.231	.246	.069	.659***	.613***	.516***	
IES-R	.113	.458***	.340*	.123	.289*	.343*	.044	.551***	.618***	.391**	.675***

Note. CGI-C = Clinical Global Impression–Change scale; SUDS = Subjective Units of Distress Scale; BDI = Beck Depression Inventory; SAI = State Anxiety Inventory; TAI = Trait Anxiety Inventory; PSDI = Positive Symptom Distress Index; IES-R = Impact of Event Scale–Revised.

* $p < .05$. ** $p < .01$. *** $p < .001$.

the end score of the second (Spearman rho = .511, $p < .001$) and the third session (Spearman rho = .606, $p < .001$).

Validity

Convergent and Discriminant Validity. The initial SUDS score at the first session showed a significant correlation with the BDI (Spearman rho = .28, $p < .05$) and the SAI (Spearman rho = .31, $p < .05$). These findings indicated that the SUDS rating is related to the patient's levels of current anxiety and depression and thereby demonstrated convergent validity. On the other hand, the SUDS scores did not correlate with the TAI (Spearman rho = .21, $p > .05$), suggesting that it is related to state anxiety but not to trait anxiety, thus showing some discriminant validity. The SUDS was not correlated with demographic characteristics, including the patient's age (Spearman rho = -.23, $p > .05$), level of education (Spearman rho = -.16, $p > .05$), and income (Spearman rho = .12, $p > .05$), thus further demonstrating discriminant validity.

Predictive Validity. The SUDS score at the end of the first session was significantly correlated with the CGI-C score at termination (Spearman rho = .32, $p < .05$), which means that there is a modest predictive validity for the treatment response. Predictive validity was also shown with the significant correlations of this SUDS score with those at the end of the second (Spearman rho = .51, $p < .001$) and the third sessions (Spearman rho = .61, $p < .001$).

Concurrent Validity. The initial pretreatment SUDS scores at the first session showed a significant correlation with the PSDI of SCL-90-R (Spearman rho = .50, $p < .001$), indicating a moderate concurrent validity with the level of symptomatic distress. Moreover, a significant correlation with the IES-R (Spearman rho = .46, $p < .001$) also suggested a moderate concurrent validity with the level of distress from traumatic or stressful events (Table 1).

Discussion

Prior to this study, two studies had evaluated the convergent validity of the SUDS with physiological manifestations of anxiety (Thyer et al., 1984) and self-reported anxiety (Kaplan et al., 1995). However, it is difficult to generalize these findings to a corresponding validity of the SUDS in therapy. The purpose of the current research was to investigate the validity of the SUDS measure in EMDR treatment. The findings provided preliminary evidence for the psychometric properties of the SUDS. In this process, we also

documented some interesting information concerning the role of the SUDS rating in EMDR treatment.

Validity

This study evaluated the concurrent validity of the SUDS with the IES-R and the PSDI subscale of the SCL-90-R and determined that SUDS scores at pretreatment predicted scores on both these measures. The PSDI is the average rating given to those symptoms that clients complain about (Derogatis et al., 1976). Consequently, it reflects the overall level of general distress and is not restricted to specific memories or events. The IES-R measures distress related to the index traumatic event, with related intrusive, avoidance, and hyperarousal symptoms. In EMDR, the SUDS is used to assess both these types of distress, and the findings of this study indicate that it has concurrent validity in this measurement. Likewise, the convergent validity of the SUDS was assessed by evaluating its relationship to measures of current anxiety and depression. The SUDS measure showed convergent validity with state anxiety and discriminant validity with trait anxiety. However, given the lack of a consensus on what constructs are measured by the SUDS, these outcomes should be interpreted with caution.

One interesting finding was related to predictive validity. The SUDS score at the end of the first session predicted the overall treatment response at the termination of treatment (LOCF). It appears that participants with lower distress at the end of the first session had less distress at the end of subsequent sessions and a better outcome at the termination of treatment. While clinicians should be alert to SUDS scores remaining high at the end of the first session, it should be noted that this is correlational research, and no causation can be inferred. Future research should evaluate reasons for elevated SUDS scores at session end and the impact of this result on treatment outcome. It appears that those patients who respond rapidly and effectively in the first session continue to do so throughout the course of treatment; this could reflect their responsiveness to treatment of individual characteristics. It is also possible that a failure to reprocess the index traumatic memory in the first session could affect the entire course of treatment or perhaps lead to attrition or early termination. It may be important to choose a target for the first session that will readily respond to treatment and result in significantly reduced distress. Choosing small goals that are more likely to be achieved may be one solution, as in EMDR with multiply traumatized individuals

(Parnell, 1999). Further research is needed to investigate these questions.

In addition, the results of this study provide a clue to the possible problem of demand characteristics raised when the therapist continues to proceed until the SUDS score further decreases (DeBell & Jones, 1997; Lohr et al., 1992). Since the SUDS score at the end of the first session correlated with and predicted treatment outcome, it may be advisable for the therapist to encourage the client to continue processing and not to end the session prematurely.

Several difficulties of studying SUDS data from actual sessions should be mentioned. Ideally and for research purposes, the SUDS should reflect one type of emotion or distress, such as anxiety. However, many other types of distress may evolve, including guilt, anger, helplessness, sadness, and disgust, among other emotions. It was apparent in the current study that the SUDS score could not be obtained for a single isolated emotion, and this in turn may explain the significant but modest level of convergent and concurrent validity. In addition, one needs to consider that in some clients after desensitization, the type of emotion rated with the SUDS may have been changed. For example, fear may have changed to anger, or anxiety may have converted to sadness.

The target of each session may also differ among clients. Thus, the target memory may not be the index trauma that brought the patient in for clinical attention. This may also partly explain the only modest concurrent validity with IES-R.

Limitations

Limitations of this study involve lack of an independent assessor. PTSD was the only psychiatric diagnosis made using a standardized diagnostic interview. No psychometric data were collected at post-treatment. The treatment outcome measure was a rating provided by the therapist. Future research is recommended to further evaluate these preliminary findings.

Summary

In conclusion, this preliminary study confirmed that the SUDS scores obtained in EMDR sessions have good psychometric properties, with evidence of convergent and discriminant validity, concurrent validity, and predictive validity. Further investigation of the construct and clinical meaning of the SUDS is necessary. For example, a possible prediction of the overall treatment response from the final score on the SUDS at the first session may be informative, with high

scores perhaps raising a red flag to EMDR clinicians. Further research is needed to evaluate the role of the SUDS score in the EMDR treatment process.

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