MILITARY MEDICINE, 171, 9:900, 2006

Assessing the Validity of the Stages of Change Readiness and Treatment Eagerness Scale with Treatment-Seeking Military Service Members

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The purpose of this project was to assess the concurrent and predictive validity of the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) for military service members undergoing substance abuse treatment. Concurrent validity was assessed by examining the correlation of SOCRATES subscales with subscales from the Addiction Treatment Attitude Questionnaire. Predictive validity was assessed by examining the ability of SOCRATES subscales to predict length of stay in treatment and successful completion of treatment. Scores on the SOCRATES were correlated in the expected direction with scores on the Addiction Treatment Attitude Questionnaire and predicted length of stay in treatment and successful completion of treatment. The findings provide support for the validity of the SOCRATES with substance abuse treatment-seeking military service members.

Introduction

It has been argued that readiness to change may be a prerequisite for the successful resolution of psychological disorders, including addictions.[1] According to the transtheoretical model of change, motivation to change problematic behavior can be classified into one of several stages, i.e., (1) Precontemplation, (2) Contemplation, (3) Preparation, (4) Action, or (5) Maintenance.[2] Precontemplation is the stage in which the individual has no intention to change the problem behavior. Contemplation occurs when there is recognition of the problem, but a commitment to change has not been activated. Preparation occurs when there is intention to change the behavior and a plan of action. Action occurs when the individual is actively engaged in the change process. Finally, maintenance is the stage in which individuals consolidate gains and act to prevent relapse.

Clinically, readiness to change is regarded as a dynamic factor that can be enhanced through appropriate intervention. Knowledge of a patient's current stage of change can provide information to treatment providers regarding treatment planning. For example, action stage-oriented treatments may be appropriate for individuals in the action stage but may be detrimental to those in earlier stages of readiness.[2] Therefore, identifying a patient's stage of readiness may increase treatment effectiveness by either focusing on an intervention appropriate to the patient's stage of change or focusing on increasing a patient's readiness by advancing them to the succeeding stage in the change process. Treatment can be focused for the individual patient to maximize behavioral change. To this end, a series of "motivational interventions" have been developed to facilitate the treatment of substance abuse by encouraging patients' movement from one stage of change to the next.[1]

The findings of Project MATCH, the largest substance abuse treatment-matching study to date, highlighted the significance of readiness to change. Specifically, patients with greater readiness to change at initial clinical contact underwent larger decreases in substance use after discharge from treatment than did patients with lesser readiness to change.[3] In addition, in another study, motivation to change at intake was related to substance abuse patients' involvement in treatment as well as their retention in treatment.[4] Specifically, higher internalized motivation was associated with greater interpersonal help-seeking, greater confidence in treatment, better attendance in treatment, higher rates of treatment completion, and greater involvement in treatment.

One method for assessing readiness to change is the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES).[5] The SOCRATES specifically assesses readiness-to-change patterns of substance use. The scale was originally normed by using the Project MATCH data pool, which consisted of a treatment-seeking group of alcohol-dependent patients. Factor analysis of this group revealed three orthogonal factors, which have been described as continuous motivational processes underlying the five stages of change. The three factors serve as subscales and provide information on different aspects of the readiness-to-change continuum. The Recognition subscale reflects the extent to which the respondents acknowledge they are experiencing a substance abuse problem and perceive harm will come if they do not change. The Ambivalence subscale reflects the extent to which the respondents are conflicted about the pros and cons their substance use pattern. The Taking Steps subscale reflects the extent to which the respondents are actively engaged in the change process. The SOCRATES has been used in addiction medicine to assess readiness to change in a variety of populations.[5-9]

To date, the published literature on the SOCRATES has focused on treatment-seeking adults with alcohol dependence,[5] adult primary care patients identified as "at-risk drinkers,"[6] binge-drinking undergraduate students,[7] substance-abusing adolescents,[8] and alcohol-dependent outpatients from Brazil.[9] The research reveals mixed evidence for the three previously identified factors. Although researchers have frequently identified the Taking Steps factor, support for the remaining two factors has not been consistent and they have sometimes been combined into a single factor.[6,8,9] In addition, depending on the

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The views expressed in this article are not to be construed as the official policy or position of the Department of Defense or other government agencies.
This manuscript was received for review in August 2005 and was accepted for publication in April 2006.

sample, factor analyses of the SOCRATES have produced 14-item,[8] 15-item,[6] and 16-item solutions.[7]

Currently, there is a paucity of research examining motivation to change by using the SOCRATES or any other readiness-to-change instrument with an active duty military population. Examining such a group is important because of the reported literature highlighting potential demographic and clinical differences between military and civilian treatment samples. For example, compared with civilian groups, military personnel are more likely to be younger, to be fully employed, to be attending treatment for the first time, to present with fewer physical symptoms, and to score lower on measures of alcohol use and psychiatric problems.[10,11] Psychometric analysis of the SOCRATES with a military substance abuse population has yielded three factors and 14 items.[12] The three factors correspond to the Project MATCH subscales, i.e., Recognition, Takings Steps, and Ambivalence. Although the basic psychometric properties of the SOCRATES with military service members have been addressed, research on the validity of the instrument with military service members has yet to be reported.

The present study examined the concurrent and predictive validity of the three-factor, 14-item SOCRATES by using a clinical sample of active duty military service members seeking substance abuse treatment. In the present study, concurrent validity was assessed by examining the correlation of the SOCRATES subscales with three subscales from a substance abuse treatment process measure, the Addiction Treatment Attitude Questionnaire (ATAQ).[13] The three ATAQ subscales used were (1) Powerlessness, which assesses the extent to which respondents perceive their substance use as unmanageable and out of control, (2) Commitment to Abstinence, which assesses the extent to which respondents believe that they must abstain from substances to successfully recover from their substance problems, and (3) Disease Attribution, which assesses the extent to which respondents accept the disease model of addiction. It was expected that patients who portrayed themselves on the ATAQ as relatively powerless over their substance use, suffering from an addictive disease, and committed to abstinence would also portray themselves high on the readiness-to-change dimensions assessed by the SOCRATES, and that patients who portrayed themselves low on these ATAQ dimensions would portray themselves low on the readiness-to-change dimensions assessed by the SOCRATES.

Predictive validity was assessed by examining the ability of the SOCRATES to predict length of treatment and successful completion of treatment. Patients higher in the SOCRATES dimensions were expected to remain in treatment for more days than patients lower in motivation for change. Patients higher in the SOCRATES dimensions were also expected to be more likely to successfully complete treatment.

Methods

Participants

Data for this project came from a database of 357 active duty military service members consecutively admitted to a 4-week substance abuse treatment program. Participants had been diagnosed with alcohol and/or drug dependence and referred for residential or partial hospitalization treatment. Participants were predominantly male (88%) and ranged in age from 18 to 52 years (mean, 25.9 years; SD, 6.7 years); 73.1% of participants identified their ethnicity as Caucasian, 8.7% as African American, 6.7% as mixed, 6.2% as Latino/a, 3.9% as Native American, and 1.4% as Asian. Participants were officers and enlisted service members from all branches of the uniformed service, stationed domestically and abroad.

Measures

SOCRATES

The SOCRATES is a self-report readiness-to-change measure created specifically for substance abuse patients. There is an alcohol version of the scale and a drug version of the scale. The versions are identical except that words such as "drinking" on the alcohol version of the scale are replaced with "drug use" on the drug use version of the scale. Respondents rate their agreement with each item on a 5-point Likert-type scale (e.g., 1 = no! strongly disagree; 5 = yes! strongly disagree). As mentioned earlier, the scale consists of three subscales, namely, Recognition, Taking Steps, and Ambivalence.

ATAQ

The ATAQ is a self-report measure that assesses a range of attitudes toward the substance abuse treatment process. Four subscales from the ATAQ (Powerlessness, Commitment to Abstinence, Disease Attribution, and Self-Criticism) were administered at intake, because the remaining subscales (e.g., Commitment to Alcoholics Anonymous, Relapse Prevention) are relevant only once participants have been exposed to treatment. The self-criticism subscale was not analyzed for purposes of the present study because it was not deemed to have a theoretical relevance to the validity of the SOCRATES. Like the SOCRATES, there are alcohol and drug versions of the ATAQ, which are identical except for words such as "drinking" and "drug use." Respondents rate their agreement with each item on a 5-point Likert-type scale (e.g., 1 = strongly disagree; 5 = strongly agree). ATAQ subscale scores have been correlated with progress in treatment, relapse, severity of relapse, and readiness to change.[13-15]

Procedure

Before their admission to the treatment program, participants had been diagnosed with a Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition,[16] substance abuse disorder by a medical officer and referred for residential or partial hospitalization treatment, according to the American Society of Addiction Medicine Patient Placement Criteria for the Treatment of Substance-Related Disorders, Second Edition Revised.[17] Upon admission, participants with an alcohol dependence diagnosis and no comorbid drug diagnosis completed alcohol versions of the SOCRATES and ATAQ subscales. Participants with a drug diagnosis and no comorbid alcohol diagnosis completed drug versions of these scales, and participants with comorbid alcohol and drug diagnoses completed the version they thought reflected their primary problem. Although participants were formally admitted to residential or partial hospitalization treatment, participants actually tended to alternate from one level of treatment to the other, depending on their assessed need for

TABLE I

DESCRIPTIVE DATA AND INTERCORRELATIONS FOR MEASURES

Variable	Variable						
	1	2	3	4	5	6	7
Pearson correlation coefficient							
1. ATAQ commitment to abstinence	—						
2. ATAQ disease attribution	0.69[a]	—					
3. ATAQ powerlessness	0.72[a]	0.77[a]	—				
4. SOCRATES ambivalence	0.23[a]	0.22[a]	0.31[a]	—			
5. SOCRATES recognition	0.73[a]	0.74[a]	0.83[a]	0.44[a]	—		
6. SOCRATES taking steps	0.30[a]	0.23[a]	0.18[b]	0.25[a]	0.34[a]	—	
7. Days in treatment	0.19[a]	0.15[b]	0.17[b]	0.23[a]	0.24[a]	0.14[b]	—
Mean	3.45	3.13	2.99	9.72	21.52	19.52	25.51
SD	0.95	1.17	1.10	2.99	6.27	4.23	9.01
Cronbach's α	0.84	0.92	0.91	0.71	0.93	0.84	—

[a] $p < 0.0001$.
[b] $p < 0.001$.

structure, access to transportation, and access to sober-supportive housing. Although the basic structure of the treatment was that of a 28-day Minnesota model program, participants may complete the program earlier or later than the projected 4 weeks. The mean length of stay among participants was 25.1 days (SD, 9.01 days). Overall, 275 participants (77%) completed the treatment program. The remaining 82 (23%) were discharged because of noncompliance or left against medical advice.

Results

Descriptive Information about Measures/Intercorrelations

Means, SDs, and a correlation matrix for the continuous variables are presented in Table I. Pearson r correlations were used to examine the concurrent validity of the SOCRATES. Each of the ATAQ subscales was significantly correlated with each of the SOCRATES subscales. The effect sizes of these correlations ranged from large (Pearson $r > 0.5$) to medium (Pearson $r > 0.3$) to small (Pearson $r > 0.1$), according to the effect size guidelines described by Cohen.[18] Large effect sizes were found between (1) Powerlessness and Recognition, (2) Commitment to Abstinence and Recognition, and (3) Disease Attribution and Recognition. Medium effect sizes were found between (1) Powerlessness and Ambivalence and (2) Commitment to Abstinence and Taking Steps. Small/medium effect sizes were found between (1) Commitment to Abstinence and Ambivalence, (2) Disease Attribution and Ambivalence, and (3) Disease Attribution and Taking Steps. A small effect size was found between Powerlessness and Taking Steps.

Linear Regression Analysis

Linear regression analysis was used to examine the extent to which SOCRATES subscales could predict length of stay in treatment. Variables were entered into the equation in a hierarchical manner. Diagnosis (alcohol vs. drug vs. alcohol/drug) and demographic variables were entered in the first step of the equation, to control for their effects. The SOCRATES subscales were entered in the second step of the equation. A summary of the linear regression analysis is presented in Table II. The test of the full model was statistically significant [$F_{(7,332)} = 4.53$; $p < 0.001$]. In the first step, age was the only significant predictor of length of stay in treatment. The direction of the effect indicated that, as age increased, so did length of stay in treatment. In the second step, the Recognition and Ambivalence subscales were significant predictors of length of stay in treatment. Increasing scores on the subscales were associated with greater lengths of stay in treatment. The Taking Steps subscale was not a significant predictor of length of stay in treatment.

Logistic Regression Analysis

Logistic regression analysis was used to examine the extent to which SOCRATES subscales could predict completion of the

TABLE II

LINEAR REGRESSION ANALYSIS OF SOCRATES SUBSCALES PREDICTING DAYS IN TREATMENT

Variable	Order of Entry	B	BSE	β	95% Confidence Interval
Alcohol/drug diagnosis	1	−1.10	1.64	−0.04	−4.34–2.13
Age	1	0.15	0.07	0.11[a]	0.01–0.29
Gender	1	1.34	1.50	0.05	−1.62–4.29
Ethnicity	1	0.23	0.32	0.04	−0.40–0.86
Ambivalence subscale	2	0.44	0.19	0.14[a]	0.07–0.80
Recognition subscale	2	0.21	0.09	0.15[a]	0.03–0.39
Taking steps subscale	2	0.11	0.12	0.05	−0.13–0.34

$R^2 = 0.02$ for step 1; $R^2 = 0.09$ for step 2.
[a] $p < 0.05$.

TABLE III

LOGISTIC REGRESSION ANALYSIS OF SOCRATES SUBSCALES PREDICTING COMPLETION OF TREATMENT

Variable	Order of Entry	*B*	*BSE*	Wald Statistic	Odds Ratio	95% Confidence Interval
Alcohol/drug diagnosis	1	−0.06	0.44	0.02	0.94	0.40–2.23
Age	1	0.63[a]	0.18	12.09	1.88	1.31–2.68
Gender	1	0.34	0.43	0.65	1.41	0.61–3.25
Ethnicity	1	0.04	0.08	0.17	1.04	0.87–1.23
Ambivalence subscale	2	0.44[a]	0.17	7.21	1.55	1.13–2.13
Recognition subscale	2	0.13	0.16	0.62	1.13	0.83–1.55
Taking steps subscale	2	0.07	0.13	0.25	1.07	0.82–1.39

Nagelkerke $R^2 = 0.07$ for step 1; Nagelkerke $R^2 = 0.14$ for step 2.
[a] $p < 0.01$.

treatment program. Treatment completion, a dichotomous variable, was coded as 0 (participant failed to complete treatment) or 1 (participant completed treatment). The continuous variables of the SOCRATES subscales were standardized to facilitate the interpretation of odds ratios. The ability of the SOCRATES subscales to predict completion of treatment was evaluated with the Wald statistic and interpreted via odds ratios.[19] Odds ratios of >1 were interpreted as indicating that increasing SOCRATES scores increased the probability of a participant completing treatment, and odds ratios of <1 were interpreted as indicating that increasing SOCRATES scores decreased the probability of a participant completing treatment. Variables were entered into the equation in a hierarchical manner. Diagnosis and demographic variables were entered in the first step of the equation, to control for their effects. The SOCRATES subscales were entered in the second step of the equation. A summary of the logistic regression analysis is presented in Table III.

The test of the full model was statistically significant (model $\chi^2 = 32.19$, $df = 7$, $p < 0.001$). In the first step, age was the only significant predictor of treatment completion. The direction of the effect and the odds ratio indicated that a 1 SD increase in age increased the odds of completing treatment by 89%. In the second step, the Ambivalence subscale was a significant predictor of treatment completion. The direction of the effect and the odds ratio indicated that a 1 SD increase in the ambivalence score increased the odds of completing treatment by 55%. Neither the Recognition subscale nor the Taking Steps subscale was a significant predictor of treatment completion.

Discussion

The present study examined aspects of the concurrent and predictive validity of the SOCRATES in a clinical sample of military service members undergoing substance abuse treatment. With respect to concurrent validity, scores on the SOCRATES subscales correlated in the expected direction with scores on the ATAQ subscales. Participants' recognition of their substance problem, as reflected by their SOCRATES Recognition scores, was correlated with their sense of powerlessness over their substance problem, as assessed by the ATAQ. Participants' Recognition scores were also correlated with ATAQ subscales assessing the degree to which participants believed that they suffered from an addictive disease and the degree to which they were committed to a long-term goal of abstinence. Participants' degree of internal conflict about the pros and cons of their substance use, as reflected by their SOCRATES Ambivalence scores, was likewise correlated with their sense of powerlessness, belief that they suffered from an addictive disease, and long-term goal of abstinence. The extent to which participants were actively changing their substance use patterns, as reflected by their SOCRATES Taking Steps scores, was also correlated with the aforementioned ATAQ constructs. Some of the correlations, such as those between Powerlessness and Recognition, Commitment to Abstinence and Recognition, and Disease Attribution and Recognition, represented large effect sizes. Overall, these correlations provide support for the concurrent validity of the SOCRATES with a military substance abuse treatment population.

With respect to predictive validity, scores on the SOCRATES Recognition and Ambivalence subscales were correlated with length of stay in treatment. As participants' recognition of their substance problem and degree of internal conflict about the pros and cons of their substance use increased, so did the length of time they remained in treatment. This suggests that participants higher on these readiness dimensions are able to remain in treatment longer than participants lower on these dimensions, even if they do not ultimately complete treatment. Scores on the Ambivalence subscale were predictive of treatment completion, such that higher scores on the subscale were associated with completing treatment. This suggests that participants with greater conflict about their substance use show greater willingness to stay in treatment and/or pose fewer disciplinary problems that result in their discharge. These findings support the predictive validity of the SOCRATES with a military substance abuse treatment population.

One limitation of the present study was the use of a single self-report measure for examination of concurrent validity. Self-report measures of other variables correlated with readiness to change, such as substance abuse severity, would have been useful in assessing the validity of the SOCRATES. The use of another readiness-to-change measure, such as the University of Rhode Island Change Assessment,[20] also would have been a useful adjunct. In addition to self-report measures, a non-self-report assessment of readiness to change, such as a clinician rating, could have been a valuable aid in examination of the validity of the SOCRATES. Future research on the validity of the SOCRATES with military service members would do well to include such measures.

A second limitation of the present study was the limited number of dependent variables available with which to assess predictive validity. By examining length of stay in treatment and completion of a 28-day program, the present study examined

outcome variables that are relatively distant from participants' readiness to change upon their entrance into treatment. It may be that participants' readiness to change, as assessed upon their intake at a treatment center, may only, and should only be expected to, predict their immediate behavior in treatment. Future research on the SOCRATES with military service members should examine its predictive utility with more immediate outcomes.

In addition to further validation, the next useful step in examining readiness-to-change instruments among military service members would be to examine the extent to which such instruments can enhance treatment. For example, can a counselor use a service member's readiness-to-change profile to determine an intervention strategy that would move the service member to a higher stage of change? Evidence that readiness-to-change instruments could help to accomplish such a goal would help to move these measures from an adjunctive role to an integral role in substance abuse treatment programs.

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