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Short communication

Motivation for change in alcohol dependent outpatients from Brazil

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Abstract

The general aim of this study was to investigate the reliability and factor structure of the stages of change readiness and treatment eagerness scale (SOCRATES) in 326 outpatients with alcohol dependence. The questionnaire was translated and cross-culturally adapted into Portuguese and back-translated to English. The confirmatory factor analysis showed that two correlated factors provided the best fit for the data.

Keywords: Alcohol; Factor analysis; Outpatient; SOCRATES; Cross-cultural validity; Motivation

1. Introduction

The stages of change readiness and treatment eagerness scale (SOCRATES) was drafted to measure the motivation to change in problem drinkers. Initially, a 32-item version was developed, with the item content specifically focused on the problem of drinking. The latest version has 19 items, consisting of three orthogonal factors named *taking steps*, *recognition*, and *ambivalence* (Miller & Tonigan, 1996). Maisto et al. (1999) reexamined the

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factor structure of the SOCRATES and found only two factors—one factor they called AMREC (a combination of ambivalence and recognition) and a second one (taking steps) that was similar with the factor of Miller and Tonigan (1996) of the same name. Confirmatory factor analysis suggested that this two-factor structure fit the data better than the three-factor structure did. The aim of the present study was to examine the reliability and factor structure of the Portuguese version of the SOCRATES (8A) among alcohol-dependent outpatients and to investigate whether a two- or three-factor structure fits the data better. There was less evidence to support a three-factor structure.

2. Methods

2.1. Setting

The study was performed at a federally funded public teaching hospital. A gastroenterology clinic and a specialist alcohol clinic were used. Inclusion criteria were (i) at the specialist alcohol treatment clinic, all patients who scored mild, moderate, or severe on the Short-Form Alcohol Dependence Data Questionnaire (SADD) and (ii) at the gastroenterology clinic, all patients scoring eight or more on the AUDIT (Méndez, Lima, Olinto, & Farrell, 1999). Thereafter, the same criteria were applied. The exclusion criteria were polydrug users and women (as there were so few of them).

2.2. Participants

One hundred and fifty-one patients were interviewed at the gastroenterology clinic and 175 from the specialist alcohol treatment clinic—all at the first appointment. The mean age was 44 years (S.D. = 11), 72% were White, 84% were in either part- or full-time employment, 57% had had at least 8 years of schooling, and 38% had some form of higher education. On the severity of alcohol dependence scale, 19% scored mild, 34% moderate, and 47% severe. Patients had consumed a median of 81.5 units of alcohol in the last 30 days and had been drinking at this level for a median of 20 weeks.

2.3. Measures

The measures used were (i) demographic data, (ii) SOCRATES Version 8A (Miller, 1995), (iii) SADD (Jorge & Masur, 1985), and (iv) pattern of alcohol consumption using the interview schedule developed for the WHO/ISBRA (Tabakoff & Dongier, 1996).

2.4. Process of translation and cultural adaptation of the SOCRATES

The scale was translated to Portuguese by two researchers with a good command of English, and each version piloted. Some complex questions had to be simplified, as patients tended to answer only one part of the question (questions 14, 15, and 20). A committee of five

bilingual healthcare professional reviewed the questionnaire before it was repiloted. The back-translated version of this final draft is available from the authors.

2.5. Statistical analysis

The factor structure and construct validity of the 19-item SOCRATES questionnaire were examined using two first-order confirmatory factor analyses, the first modeled on the three-independent-factor structure described by Miller and Tonigan (1996), and the second on the two independent factors described by Maisto et al. (1999). Cronbach's alpha was used to measure the reliability of the factors. The fit of the different models was assessed using four indices: (i) the goodness of fit index (GFI); (ii) the adjusted goodness-of-fit indices (AGFI), adjusted for degrees of freedom; (iii) a chi-squared/degrees of freedom ratio (χ^2/df) of less than 2; (iv) a standardized root-mean-square residual (RMSR) of less than 0.05; and (v) a root-mean-square error of approximation (RMSEA) of less than 0.08.

3. Results

3.1. Confirmatory factor analysis: the two- and three-factor models

The chi-squared of the three-factor model was 850.25 ($df = 152$, $P < .0001$). The indices of fit were the following: GFI = 0.793, AGFI = 0.7417, RMSR = 0.203, and RMSEA = 0.1187, which show an adequate, but less than perfect, fit between the proposed three-factor model and the current data. The chi-squared of the two-factor model was 335.72 ($df = 90$, $P < .0001$), and the indices of fit were the following: GFI = 0.8866, AGFI = 0.8488, RMSR = 0.1351, and RMSEA = 0.0915. These indices suggest a better fit for the two-factor model.

3.2. Reliability and item analysis of the two- and three-factor models

For the three-factor model of Miller and Tonigan (1996), the items making up Factor 1 (recognition) have good reliability, with item–total correlations of over .51, with the exception of Item 1. For Factor 2 (ambivalence), the correlations are all around .51, with the exception of Item 12. For Factor 3 (taking steps) the correlations are lower but still over .3, with the exception of Item 15. For the two-factor model of Maisto et al. (1999), Factor 1 (AMREC) has good reliability, with item–total correlations greater than .54, except for Item 12. The items on Factor 2 (taking steps) have correlations greater than .41, with the exception of Item 14. These results suggest that the items with low correlations should be excluded from the analysis (Table 1).

3.3. Correlation of the factors

For the three-factor model, there was a strong intrafactor correlation between recognition and ambivalence (.72), whilst the correlations between taking steps and recognition and

Table 1
CFA with factor weight and reliability analysis, with Cronbach's alpha using the data from this study, modeled on the proposed three-factor structure of Miller and Tonigan (1996) and the two-factor structure of Maisto et al. (1999)

	Confirmatory factorial analysis (Factor weights)						Reliability analysis (Chronbach's alpha)					
	Miller and Tonigan's (1996) model			Maisto et al.'s (1999) model			Miller and Tonigan's (1996) model			Maisto et al.'s (1999) model		
	Factor 1: Recognition	Factor 2: Ambivalence	Factor 3: Taking steps	Factor 1: AMREC	Factor 2: Taking steps		Factor 1: Recognition	Factor 2: Ambivalence	Factor 3: Taking steps	Factor 1: AMREC	Factor 2: Taking steps	
1	0.212*			–		1	.214			–		
3	0.574*			0.592*		3	.551			.554		
8	0.803*			0.801*		8	.730			.720		
11	0.863*			0.845*		11	.747			.736		
13	0.834*			0.828*		13	.732			.738		
16	0.663*			0.667*		16	.610			.602		
18	0.574*			0.597*		18	.513			.564		
2		0.648*		0.600*		2		.509		.614		
7		0.678*		0.553*		7		.510		.539		
12		0.239*		0.214*		12		.211		.210		
17		0.718*		–		17		.510		–		
4			0.685*		0.685*	4			.526		.574	
5			0.507*		0.528*	5			.326		.415	
9			0.554*		0.574*	9			.389		.424	
10			0.721*		0.724*	10			.524		.616	
14			0.396*		0.336*	14			.378		.282	
15			0.169*		–	15			.174		–	
19			0.646*		0.646*	19			.503		.536	
20			0.472*		–	20			.450		–	
						Alfa	.828	.646	.679	.856	.714	

* Significant at the .01 level (two-tailed test).

between talking steps and ambivalence were lower (.39 and .28, respectively). For the two-factor model, the intracorrelation between the factors was low (.26). The interfactor correlations between the two models show that recognition and ambivalence are both strongly correlated with AMREC (.96 and .87, respectively), as are the taking steps factors from each model (.89). These results suggest that the proposed factors from both of these models are not independent, indicating that a new factor structure should be investigated.

3.4. Item analysis, reliability, and CFA for a new model with two correlated factors

Item analysis and Cronbach's alpha were used with the data modeled on the combined first and second factors described by Maisto et al. (1999). The Cronbach's alpha was .85, and there were low correlations for Items 1 (.26) and 12 (.23), showing that these items do not form part of the factor. These items were excluded, and the were data reanalyzed. This corrected Factor 1 had 9 items, with item–total correlations greater than .55 and an alpha of .89. The item analysis of the third factor, described by Miller and Tonigan (1996), showed item–total correlations higher than .38, except for Item 15 (.174), and a reliability of .679. Item 15 was thus excluded from Factor 2. This corrected Factor 2 had 7 items and is similar with the second factor of Maisto et al. (1999). We named our first factor AmRec and our second factor Taking Steps.

To evaluate the structure of these two nonindependent factors, a further confirmatory factor analysis (CFA) was performed. The chi-squared of the new model was 407.22 ($df = 103$, $P < .0001$; χ^2/df ratio $= 407.22/103 > 2$), which shows that there are differences between the proposed model and the data. The indices of fit were the following: GFI = 0.869, AGFI = 0.827, RMSR = 0.091, and RMSEA = 0.0856. These results show that the model displays a good, but imperfect, fit. The correlation between the factors was .364, which is statistically significant.

4. Discussion

The transtheoretical stages of change model hypothesizes change as a process in which there is movement through a sequence of five separate stages, each characterized by a constellation of attitudes and behaviours (DiClemente et al., 1991). The validity of this model has been questioned, and attempts to measure the five stages as distinct entities have met with limited success (Davidson, 1992; Sutton, 1996, 2001). The aim of this paper was to investigate the factor structure of the Portuguese version of SOCRATES. We found that a two-nonindependent-factor structure fit the data better than a three-factor structure did—results that are similar with those of Maisto et al. (1999).

The reasons for the discrepancy between the factor structure reported by Miller and Tonigan (1996) and that found in subsequent studies are diverse. First, the instrument, in its present format, may be unable to distinguish between ambivalence and recognition because the item content of the questionnaire is inadequate. Our translation identified ambiguity in several items and the participants reported difficulties in answering them. Second,

ambivalence and recognition may be parts of the same phenomenon. Our factor analysis suggests that there is substantially more commonality between these concepts than there is uniqueness because the questions designed to measure them are highly correlated on a single factor. Third, our translation may have altered the performance of the questionnaire. However, we followed a meticulous process to ensure that a semantically equivalent, reliable, and valid version was produced, involving alternate translations, a bilingual multiprofessional committee to examined each question, taped interviews, and extensive piloting. Psychometric analysis showed that our version had good internal consistency and reliability.

It is also possible that different findings may be due to different factor analytic procedures. The study by Miller and Tonigan (1996) used factor analysis with principal components analysis, with orthogonal and nonorthogonal rotation and with a criterion of eingenvalues >1.0. Maisto et al. (1999) used principal components analysis to extract factors with eigenvalues ≥ 1.0, followed by a CFA with orthogonal rotation. They also used goodness of fit analysis to compare their two-factor model with the three-factor solution of Miller and Tonigan and found that the two-factor solution fit the data better.

Further work is necessary to investigate the psychometric properties of the SOCRATES in different clinical and cultural populations. But if the three-factor structure cannot be verified, then, either the instrument or the stages of change model need to be reconsidered.

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