DIAGNOSIS AND ASSESSMENT
Reliability and Confirmatory Factor Analysis of the Arabic Version of the University of Rhode Island Change Assessment (URICA)

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Abstract — Aim: To develop an Arabic version of the University of Rhode Island Change Assessment (URICA), and to examine its internal reliability and factor structure. Methods: Participants were 175 substance abuse/dependent male patients recruited from Al-Amal Hospital of Substance Abuse in Dammam, Saudi Arabia. The URICA was administered to all subjects by two experienced psychologists working at the detoxification and rehabilitation units. Results: All subscales showed good internal reliability and factorial validity. Coefficient alphas for each of the four scales of the URICA (precontemplation, contemplation, action and maintenance) revealed that each scale has adequate and acceptable internal consistency (ranging between 0.76 and 0.89). The correlation coefficients between all subscales confirmed the expected prediction in that scores for adjacent stages of changes showed significantly higher correlations than the scale scores for nonadjacent stages. Confirmatory factor analysis revealed an adequate to reasonable fit to the intended subscales and replicated the four-factor model of the original work. Conclusion: The Arabic version of the URICA has shown encouraging psychometric properties, supporting the validity and reliability of the four factors of the scale. The implications of these findings, and recommendation for future research, are described.

INTRODUCTION
The transtheoretical model (TTM) of change has been extensively cited and applied in the literature of substance abuse both in terms of assessments and treatments. Proposed by Prochaska and DiClemente (1982), this model considered behavioral change to occur through five stages of motivational changes. The first stage is the precontemplation stage, which is an initial stage that describes the individual as being unaware of his problem. The second stage is the contemplation stage where the individual becomes aware but still feels ambivalent about his problem. The third stage is termed the determination or preparation stage in which the individual recognizes negative consequences of his problem and considers changing his problem behaviors. The fourth stage, which is the action stage, occurs when the individual makes efforts to change problematic behavior. Finally in the fifth stage, the maintenance stage, one takes steps to maintain changes and to prevent relapse (DiClemente, 2005; DiClemente et al., 2004, 2008; Frey et al., 2005; Prochaska and DiClemente 1982; Prochaska et al., 1992).

The TTM has been applied in the assessment of motivational level and treatment programs for alcoholism, smoking cessation and other substance abuse interventional programs (Carey et al., 2001, 2002; Dijkstra et al., 1998; Miller and Rollnick 1991; Rollnick et al., 1992). Some authors have reported that the stage of Readiness to change is related to successful treatment in substance abuse (Friedman et al., 1994; Simpson and Joe, 1993), while others indicated that treatment could also be completed successfully even with patients who are coerced and held in treatment (Lawental et al., 1996).

However, several scales have been developed to assess an individual’s stage of ‘Readiness To Change’, with the final goal of designing more effective intervention programs (Buddy and Rollnick, 1996). The most frequently used scales are the 32-item University of Rhode Island Change Assessment (URICA: McConnaughy et al., 1983), the 19-item Stage of Change Readiness and Treatment Eagerness Scale (SOCRATES: Miller and Tonigan, 1996) and the 12-item Readiness to Change Questionnaire (RCQ: Rollnick et al., 1992). All of them were developed to determine the level of motivation of an individual by placing them in the appropriate stage of the change continuum. The SOCRATES and RCQ were designed specifically for alcohol users, while the URICA refers generically to a client’s ‘problem’ behavior and not specific to drug use (Carey et al., 1999).

The URICA, which is considered one of the most widely used scales in this field, yields four stages of change: precontemplation, contemplation, action and maintenance. The internal consistency and reliability of the four subscales that comprise the URICA have been reported by several studies (Abellanaz and McLellan 1993; Dozois et al., 2004; McConnaughy et al., 1983, 1989; Nidecker et al., 2008; Pantalon and Swanson, 2003; Velasquez et al., 1999). DiClemente and Hughes (1990) used a briefer version (7-items per scale) in their study of outpatients for alcohol treatment, and obtained alpha coefficients from 0.69 to 0.82, and Willoughby and Edens (1996) reported a range of 0.70–0.83, using the 28-item version of the scale. Carey et al. (1999) reported that the findings on the validity of URICA are mixed, and evidence for the predictive validity of the URICA is reported to be inconsistent (Henderson et al., 2004; Pantalon and Swanson, 2003). However, most studies support the construct validity of URICA through factor analysis and point to a factorial structure with four factors for the scale (Amodei and Lamb, 2004; Carney and Kivlahan 1995; Field et al., 2009; McConnaughy et al., 1983). Some studies also provided support to the validity of URICA through cluster analysis (e.g. Blanchard et al., 2003; El-Bassel et al., 1998; McConnaughy et al., 1983; Willoughby and Edens, 1996). More recent studies have established adequate reliability and construct validity of the URICA (Field et al., 2009; Napper et al., 2008).
The URICA was developed in English, and there are several attempts to translate and adapt it to other European and Asian languages. Examples of these include Chinese (Chan et al., 2007); German (Hasler et al., 2003); Brazilian (Figlie et al., 2005); and Norwegian (Lerdal et al., 2009). To the knowledge of the present author, none of the motivation to change scales have been translated into Arabic. The present study was carried out to examine the linguistic and psychometric adequacy of an Arabic version of URICA among substance abuse patients, with a main focus on the underlying factor structure of the scale.

METHODS

Settings
The study was performed at the Al-Amal Complex of Mental Health, Dammam, Kingdom of Saudi Arabia (KSA). Located in the Eastern Province, the Al-Amal Complex is composed of two main hospitals. The first is the mental health hospital which provides mental health and psychosocial services to psychiatric patients. The second one is the Al-Amal Hospital, which is one of the three main hospitals that were established by the Ministry of Health (KSA), to serve people seeking help for substance abuse. With a capacity of 280 beds, the Al-Amal Hospital adopts a modified version of the 12-step program with a special emphasis on a multidisciplinary approach. This involves adopting a bio-psycho-social approach in the assessment and treatment programs. The rehabilitation program itself consists of four phases, including the detoxification unit (Wards A and B), the rehabilitation units (Wards C and D) and the Continuous Care Center. The present study was approved by the scientific and ethical committee of Al-Amal Complex for Mental Health, and informed consent was taken from all subjects.

Subjects
Subjects were recruited from the addiction Units in the Al-Amal hospital. This included a convenience volunteer sample of 175 male patients who were participating in the substance abuse rehabilitation program. All participants were selected from the detoxification and rehabilitation wards, and all were diagnosed by a multidisciplinary team in the hospital as meeting the DSM-IV (American Psychiatric Association 1994) diagnostic criteria for substance abuse/dependence (alcohol and/or other substance dependence (opiates, benzodiazepines, cocaine, cannabis, etc.). Each participant was interviewed within the first three weeks of admission. Of the 175 patients, 21 were interviewed during the first week of admission, (in the detoxification ward), and the rest of the participants were interviewed within the following two weeks of admission. Their age ranged between 18 and 60 years, with an average age of 34.7 years (SD = 10.2), and with a relatively average level of formal education (M = 9 years and SD = 3.1). All subjects met criteria for substance dependence for at least one substance. The criteria for cannabis dependence were met by 69 subjects, 41 met criteria for alcohol dependence and 65 subjects met criteria for polysubstance dependence (alcohol dependence or abuse plus cannabis and/or other substance dependence or abuse, e.g. opiates, benzodiazepines, cocaine, etc.). Subjects were excluded if they showed evidence of organic central nervous system disorders, mental retardation and if they were under 18 or over 60 years of age. All subjects had received information on the objectives of the research prior to signing the informed consent.

Translation of the URICA into Arabic

The translation and cultural adaptation of the URICA was performed according to internationally recommended guidelines (Beaton et al., 2000; Guillemin et al., 1993). Thus, the procedures included forward translation, backward translation, committee review and pretesting. Forward translation into Arabic was done by two bilingual and experienced psychologists, who work with substance abuse patients. A consensus version was agreed upon by a committee of four bilingual mental health professionals, who reviewed the translations and made necessary modifications to improve the comprehensibility and cultural sensitivity of the questionnaire. After that, the backward translation was done by two independent translators who had not previously seen the original version of the questionnaire. The backward translated version was then reviewed by a committee of mental health professionals. The final version was pretested on 20 subjects randomly selected in the outpatient clinic to examine its readability and comprehensibility.

Thus, the Arabic form of URICA, which includes 32 items, was distributed to all participants with clear instructions to indicate the extent of their agreement with each item on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). No modification was introduced to the ‘generic’ format of the items, but each participant was directed to select a problem behavior related to his current drug use, and to think about it while completing the URICA (McConnaughy et al., 1983).

Data analysis

The SPSS version 15.0 for Windows was used for descriptive statistics, correlation analyses and to perform Cronbach’s alpha for reliability analysis. Confirmatory factor analyses (CFA) were performed using the four-factor model of the URICA found in the original and other studies (e.g. McConnaughy, et al., 1983, 1989). The structural equation modeling was employed (LISREL 8.51; Jöreskog and Sörbom, 2002). Four criteria were used: (a) the Goodness-of-Fit Indices (GFI, where an excellent fit is indicated by values >0.90); (b) the Adjusted Goodness-of-Fit Indices (AGFI, for which values exceeding 0.80 are considered excellent); (c) a standardized Root-Mean-Square Residual (RMSR, values <0.05 are required for a close fit); and (d) a Root-Mean-Square Error of Approximation (RMSEA), for which a value of <0.08 is required, (Arbuckle, 2006; Browne and Cudeck, 1993; Jöreskog and Sörbom, 2002).

RESULTS

Sample characteristics

The mean age for the total sample (n = 175) was 34.7 years (SD = 10.2, range 18–60). Ninety-six subjects (54.9%) were single, 55 (31.4%) were married and 24 (13.7%) were...
correlation analysis was also used to examine the assumption that the correlations between adjacent factors should be higher than for the distanced (nonadjacent) factors, see McConnaughy et al. (1983). This assumption was supported in that precontemplation correlated negatively with all other factors, with the highest correlation being between contemplation and action ($r = 0.63$); the results of the Pearson correlation is shown in Table 3.

**Confirmatory factor analysis**

The CFA (LISREL 8.51; Jöreskog and Sörbom, 2002) was used to examine the fit of the present data to the proposed factors of URICA, based on the original theory and previous research findings. The CFA applied here revealed that the four-factor model had adequate to reasonable fit indices (GFI = 0.89; AGFI = 0.91; RMSR = 0.04 and RMSEA 0.06). Therefore, the CFA of the present study suggests that the model that considered the four factors of the URICA demonstrated an acceptable fit.

**DISCUSSION**

The purpose of this study was to evaluate the psychometric properties of an Arabic version of the URICA among substance abuse/dependent patients from Saudi Arabia. To the knowledge of the author, this is the first study on the applicability of the stages of change model in an Arabic-speaking sample, using an Arabic version of the URICA. Our findings showed that the psychometric properties of the URICA resemble those reported in the original English version, and in other language versions (Figlie et al., 2005; Lerdal et al., 2009; McConnaughy et al., 1983, 1989). The factor structure of the URICA for the present sample is consistent with the four-factor structure previously established for this scale (Amodei and Lamb, 2004; Carney and Kivlahan, 1995; Field et al., 2009; McConnaughy et al., 1983; Napper et al., 2008; Nidecker et al., 2008), thereby giving further support to the factorial and cross-cultural validity of the scale and the stage of change model.

The internal reliability of the URICA, and its four subscales (stages), were also found to be satisfactory and is consistent and similar to the previously reported studies with other populations (e.g. Field et al., 2009; McConnaughy et al., 1983, 1989; Napper et al., 2008; Pantalon and Swanson, 2003). As it was predicted, in this study, the correlations between adjacent factors are stronger than between nonadjacent ones. Factors that representing two stages near to each other showed higher correlation than the two factors representing nonadjacent stages of change. Thus, moderate, positive and statistically significant correlations were found between the contemplation, action and maintenance stages,
while the correlation of $P$ to all the three factors was negative. This is also consistent with the prediction of the original model (McConnaughy et al., 1983) and other related studies (e.g. Abellanas and McLellan, 1993; McConnaughy et al., 1989). Thus, significant positive correlation between the three latent factors would suggest that high score in one stage would possibly be accompanied by high score in the other stages. The higher correlations between adjacent factors would give support to the hypothesis that these factors are not independent and may represent a continuum of the process of change, although some authors have criticized the prediction of such an assumption as not well established (Sutton, 2001).

The exception for this trend is the correlation between precontemplation and contemplation, which showed negative correlations, although they represent adjacent stages. However, this negative correlation was likely to occur as it may reflect the ambivalent state of the participants and would express the tendency of many patients to deny the presence of a problem despite the presence of interest to change. This might be motivated by a stronger tendency to avoid stigmas against addictions and substance dependency which might prevail in such a conservative society as that of Saudi Arabia. Additionally, substance abuse patients in this society are aware that such behaviors as alcohol drinking and drug use are extremely rejected and prohibited by the society and the religious rules in this society. This would make it exceptionally difficult for the person to admit that they have such a problem. This explanation is supported by the observation that the number of patients who are brought in by (others) such family members, friends and/or employers, is relatively higher than those who seek help voluntarily (Table 1).

Towen together, these results suggest that the psychometric properties of the URICA scales are considered adequate for use with the Arabic-speaking population. One important implication of this study is that the URICA could be used as a suitable measure of the TTM and the stage of change in Arabic-speaking patients with substance abuse/dependent. This would also give support to the claim that clinicians and practitioners in this field could use this instrument to determine at which stage of changes their patients are functioning. Assessing and determining some clues for the level at which the patient is functioning before we start any rehabilitation program is very important and can greatly facilitate the provision of services. This is especially true if we take into consideration the larger number of frequent admissions, and probably the number of drop-outs, among substance abuse patients (Table 1). The inclusion of the URICA to the assessment protocols could, therefore, be an adequate addition to the whole clinical protocols used in these rehabilitation programs.

One limitation of this study is that it did not examine the predictive validity of the URICA, which is considered an essential part of the psychometric properties scales that consider ‘changes’ in behavior, and which are designed to measure these changes as a consequence of intervention programs. As indicated by other authors (Etter and Perneger, 1999; Sutton, 2001), longitudinal studies are needed to examine the predictive validity and the usefulness of these scales.

Another limitation is related to the sample and sampling procedure. First, the sample was limited only to male, as the study was conducted in a setting that provides services to male patients. Secondly, the sample was recruited from those patients who were available in Ward B and C, which represents the second stage of four phases of the rehabilitation program. This might cause over-representation of patients in the earlier stages (i.e. the precontemplation and contemplation stages). Thus, it would be interesting to further examine the predictive validity of the URICA using an improved sampling procedure and longitudinal method.

In conclusion, the Arabic version of the URICA, as applied to a sample of patients with substance abuse/dependent in Saudi Arabia, showed good internal consistency and adequate factor structure, replicating the original factor components of the scale. However, the findings of the present study are limited by the sampling procedures and necessitate further validation research to cover other psychometric properties, such as predictive validity.

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