Confirmatory factor analysis (CFA) of the Crack Use Relapse Scale (CURS)

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Keywords: Crack cocaine, drug, substance abuse, relapse, inpatient, scale.

Abstract

Background: When it comes to crack/drug use, relapse is a relatively common event in the first weeks after the end of treatment. However little is known about what happens to patients who relapse after discharge. Objective: To report the confirmatory factor analysis (CFA) of the Crack Use Relapse Scale (CURS) in an inpatient population. Methods: A five-point Likert scale with 25 items and, initially, 9 theoretical factors was generated and utilized in a cross-sectional study with a sample of 333 hospitalized male crack users. Results: CFA indicated a well-fitting model for the CURS. Discussion: The CFA shows that the CURS model is appropriate and well-fitting for assessment of latent variables common to psychiatric and psychological constructs – in this case, relapse of crack cocaine use after inpatient treatment.


Introduction

When it comes to crack/drug use, relapse is a relatively common event in the first weeks after the end of treatment, in both inpatient and outpatient care. Recent data shows that crack users have in increasing sought care from rehabilitation facilities, but, still, little is known about what happens to patients who relapse after discharge as there are very few studies that focus on this subject.

A qualitative study in which 14 crack users were interviewed showed that family, emotions, feelings, coping, sex, treatment, crime, positive expectations and craving are factors associated with relapse. Those reports served as basis for the instrument presented in another paper.

This study aims to describe the confirmatory factor analysis of CURS/Crack Use Relapse Scale, it is a unique and specific tool for assessing crack users relapse. The CURS assesses risk factors that may cause the user to slip back soon after discharge from treatment that may serve to help creating new strategies to increase their self-efficacy and coping skills over relapse to the specific use of crack.

Methods

Development of the scale

The development of the scale, presenting the pilot study and initial psychometric validation emphasizing the exploratory factor analysis can be accessed, respectively, in two previous publications.

Sample

Using a cross-sectional design, a convenience sample of male crack users hospitalized in a public psychiatric hospital in Porto Alegre, Brazil, was recruited. The total sample comprised 333 participants, most of whom were white (74.4%). Only a minority of subjects claimed to live in a marital relationship (16.5%). Mean age (25.9 years, SD 7.96) and educational attainment, were also noteworthy characteristics: n = 239 (71.8%) – incomplete elementary school, n = 65 (19.5%) – high school, n = 24 (7.2%) – Higher Education and n = 5 (1.5%) – illiterate.

All research participants had a DSM-5 diagnosis of Cocaine Dependence – specifically, crack cocaine dependence – established by psychologists and psychiatrists specializing in drug dependence.


Keywords: Crack cocaine, drug, substance abuse, relapse, inpatient, scale.

Discussion:

CFA indicated a well-fitting model for the CURS.

It is measured by the chi-square statistic (RMSEA) which estimates how well the model parameters reproduce the population covariance where values less than 0.05 indicate good fit, and values up to 0.08 represent reasonable error; goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) that measure the relative amount of variance and covariance explained, where the latter suffers a penalty by the inclusion of an additional parameter will be included as indices of adjustments. Values near to 1 indicate a good fit of the model of the scale; comparative fit index (CFI), and Tucker Lewis index (TLI).
Table 1. Crack Use Relapse Scale (CURS)
The following list presents several risk factors that may influence the relapse of crack users. Read each item and circle the number that best reflects your opinion on how much you disagree or agree, in relation to your use of crack during the past six months:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Disagree completely</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Agree completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Family conflicts</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>2</td>
<td>Intimate relationship conflicts (e.g., with partner)</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>3</td>
<td>Feelings of sadness</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>4</td>
<td>Feelings of loneliness</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>5</td>
<td>Feelings of anxiety</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>6</td>
<td>No hope</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>7</td>
<td>Dissatisfaction</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>8</td>
<td>Feelings of pleasure</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>9</td>
<td>Feelings of euphoria</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>10</td>
<td>Excessive self-confidence</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>11</td>
<td>Craving for crack</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>12</td>
<td>Craving for crack after the use of another drug</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>13</td>
<td>Exchange of sex for crack when craving strikes</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>14</td>
<td>HIV infection</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>15</td>
<td>Infection with sexually transmitted diseases other than HIV</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>16</td>
<td>Difficulty accessing treatment in the public health service</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>17</td>
<td>Imprisonment due to crack use</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>18</td>
<td>Theft and robbery due to crack use</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>19</td>
<td>Involvement with the drug trade</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>20</td>
<td>Unemployment</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>21</td>
<td>Favorable social environment for the consumption of crack</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>22</td>
<td>Inability to cope with situations posing a high risk of crack use</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>23</td>
<td>Lack of perspectives for a new lifestyle</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>24</td>
<td>Lack of healthy habits, e.g. involvement in sports</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
<tr>
<td>25</td>
<td>Lack of spirituality</td>
<td>I disagree completely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>I agree completely</td>
</tr>
</tbody>
</table>

Methodology of final scores
In a previous publication, the factor loadings of each item in each domain were discriminated. These loadings are important for the development of the final scores. We realize that the largest factor loading links the item to its corresponding factor. For example, the first 7 items that have larger loadings 0.579 that are related with higher intensity to the factor 1 contributing more of the other items.

Ethical aspects
The study was approved by the Institutional Review Board of Hospital de Clínicas de Porto Alegre.

Results
Dimensionality of the CURS
After EFA, the CURS had a six-factor model. The six factors represent the scale in its entirety. The KMO found was 0.774 and the Bartlett’s test was significant (p < 0.001). The composite model with 6 factors explained 62.2% of the variability of 25 items.

Six-factor model
Factor 1 – Emotions, family and affect – assesses feelings of loneliness, anxiety, hopelessness, sadness, and dissatisfaction; Factor 2 – Coping – assesses strategies used to cope with crack use, as well as lifestyle, habits, and spirituality; Factor 3 – Health, sex and treatment – assesses aspects pertaining to physical health, sexuality, and treatment access; Factor 4 – Legal and social aspects – assesses involvement in crime (theft, robbery, drug trafficking), imprisonment, and unemployment; Factor 5 – Positive expectations – assesses beliefs regarding crack consumption, euphoria, pleasure, and self-confidence; and Factor 6 – Craving – assesses users’ cravings for crack cocaine.

Confirmatory factor analysis
OF was 775.9 with 258 degrees of freedom (p < 0.001). GFI and AGFI were 0.851 and 0.812 respectively, indicating good fit. CFI was 0.848 and TLI, 0.824. The RMSEA was 0.078 (< 0.080). All indices had satisfactory values, suggesting a well fitting model (Figure 1).

The Figure 1 shows the six factors of the CURS (represented by the large circles). Each rectangle represents one item of the questionnaire, linked to its parent factor by a single-headed arrow. The double-headed arrows connected to items 1, 2, 6, and 7 represent covariance between two latent variables. Only for items 6 and 7 was simplification of statements believed to facilitate understanding.

Reliability
The Cronbach’s alpha values obtained for the total scale (0.86) and each of the six factors were high, suggesting high internal consistency, as the literature states that values > 0.60 are considered acceptable.

Discussion
Our findings show that the CFA then demonstrated satisfactory values for all fit indices, confirming the good fit of the underlying model of the scale and, consequently, the adequacy of the scale to measure its proposed construct. CFA is fully able to evaluate this adequacy, aiding the development of psychological, psychiatric and social models, particularly those designed to measure abstract constructs (latent variables), as in the present study.

Significant aspect of the study was demonstrated by CFA, which ratified all prior psychometric analyses and enabled assessment of the structural model underlying the CURS in a reliable, scientific manner, bearing in mind that the evaluation of latent variables (factors) can be particularly challenging, and these variables cannot be observed directly when the construct of interest is both biological and psychosocial in nature. Therefore, we chose to simplify items...
Figure 1. Path diagram of confirmatory factor analysis of the CURS items and their respective factors.

Finally, we believe the greatest efficacy in preventing relapse among crack users can be achieved through the fact that users know their own vulnerabilities, as enshrined in the health belief model, according to which individuals are able to carry out preventive behaviors with respect to a certain condition merely by believing they are susceptible to the condition and subsequently taking preventive action to modify their behavior. Possibly, the CURS is an instrument capable of providing these data to researchers and clinicians working with crack cocaine users.

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Authors’ contributions

RSP managed the data collection, conducted preliminary data analysis, drafted the manuscript, conducted the final data analysis and revised the manuscript. LBZ, MP, JNS and VMG conducted preliminary data analysis and revised the manuscript, LSPG undertook interpretation of data, the statistical analysis and revised the manuscript, FHPK undertook interpretation of data, conducted preliminary data analysis and revised the manuscript, FP designed the research questions and was responsible for general coordination and revision of the manuscript. All authors read and approved the final manuscript.

Conflict of interest statement

The authors have no competing interests.
References


