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Abstract

The study aimed to verify the discriminant capacity of the factors of the Clinical Dimensional Personality Inventory 2 (IDCP-2) in the identification of people with substance dependence, as well as to compare this capacity with another instrument that evaluates pathological traits, the Personality Inventory for DSM-5 (PID-5). The sample was composed of 253 adults distributed in three groups: community sample, represented by 110 individuals with ages between 20 and 66 years (M = 32.3; SD = 10,1), 71.8% women; subclinical, 119 individual aged from 18 to 63 (M = 30.4; SD = 8.34), 61.3% women; clinical, 24 individual with ages between 19 and 59 (M = 36,4; SD = 11.2), 83.3% men. Two scales for substance dependence identification were administered (AUDIT and ASSIST), IDCP-2, and PID-5. Findings indicated that IDCP-2 is capable of discriminating between groups, mainly the extreme ones (i.e., clinical sample versus community sample). Moreover, similar discriminant capacity between IDCP-2 and PID-5 was observed. These findings are preliminary evidence that the IDCP-2 factors can identify people with substance dependence, with Hopelessness being the leading factor in the assessment of substance dependents.
Keywords: psychological assessment; public health; drug addiction.

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Investigación de la capacidad de los factores del Inventario Dimensional Clínico de Personalidad 2 para discriminar personas con dependencia de sustancias

Resumen

El objetivo de este estudio fue verificar la capacidad de los factores del Inventario Dimensional Clínico de la Personalidad-2 (IDCP-2) en la identificación de personas con dependencia química, así como comparar su capacidad discriminatoria con otro instrumento que evalúa rasgos patológicos, el Personality Inventory for DSM -5 (PID-5). La muestra contó con 253 personas divididas en tres grupos: población general, con 110 personas con edades entre 20 y 66 años (M = 32.3, DP = 10.1) y 71,8% del sexo femenino; subclínico, con 119 individuos con edades entre 18 y 63 años (M = 30,4, DP = 8,34) y 61,3% del sexo femenino; clínico, con 24 participantes siendo 83,3% del sexo masculino y con edades entre 19 y 59 años (M = 36,4, DP = 11,2). Se aplicaron dos instrumentos para la identificación de la dependencia química (AUDIT y ASSIST), además del IDCP-2 y el PID-5. Los resultados indicaron que los factores utilizados del IDCP-2 son capaces de diferenciar los grupos, principalmente los extremos (clínico y población general). Además, se observó que el IDCP-2 posee capacidad predictiva de la dependencia química similar al PID-5. De esta manera, los hallazgos se configuran como evidencias preliminares de que los factores del IDCP-2 son capaces de identificar personas con dependencia química, siendo Desesperanza el factor principal en la evaluación de los dependientes químicos.
Palabras clave: evaluación psicológica; salud pública; dependencia química.

Introduction

Drug use and drug abuse are increasingly common terms in modern society, generating concerns and demands in the area of public health (Merz, 2018). The pathological extreme of drug use concerns drug addiction. According to the World Health Organization (WHO, 2015), substance dependence refers to behavioral, cognitive and physiological phenomena that are caused by the repeated use of substances, including a desire for use, difficulties in controlling it even when facing the consequences, a higher priority given to drug use than to other activities and obligations, tolerance, and physical abstinence. The etiology of substance dependence is related to social (e.g., socioeconomic status), biological (e.g., genetic), interpersonal relationships (e.g., family conflicts), and psychological characteristics (e.g., personality traits) (Frisher, Crome, Macleod, Bloor, & Hickman, 2007; Goode, 2007; Nakhaee & Jadidi, 2009).

The literature indicates specific personality traits typically increased in people diagnosed with substance dependence (Littlefield & Sher, 2016). For instance, people with this diagnosis are prone to present high levels of hopelessness, depression, superiority, dominance, callousness, anxiety, impulsivity, and manipulation traits (APA, 2013; Bornovalova, Lejuez, Daughters, Rosenthal, & Lynch, 2005; Kotov et al., 2017). Among these traits, impulsivity and anxiety seem to be the most commonly observed pathological traits in people with substance dependence (Chapman & Cellucci, 2007; Feingold, Weiser, Rehm, & Lev-Ran, 2016; Grant et al., 2004; Kotov, Gamez, Schmidt, & Watson, 2010; Loree, Lundahl, & Ledgerwood, 2015; Marín-Navarrete et al., 2018; Verdejo-García, Lawrence, & Clark, 2008).

Assessment measures that evaluate pathological traits should encompass traits typically identified in people with substance dependence. The Clinical Dimensional Personality Inventory (Carvalho & Primi, 2015), currently in its second version (IDCP-2; Carvalho & Primi, in press) and the focus of this study, is a self-report scale for assessing pathological traits, composed of 206 items that must be answered on a four-point Likert scale. The scale was developed to be used in the clinical context, and its recommended for establishing the personality profile of the patient (Carvalho, 2019). The IDCP-2 is composed of 12 dimensions, namely: dependence, aggressiveness, mood instability, eccentricity, need for attention, grandiosity, distrust, isolation, criticism avoidance, self-sacrifice, conscientiousness, and inconsequence, which are divided into 47 factors. The psychometric properties of the factors of these dimensions suggested the suitability of the scale for assessing pathological traits (e.g., Carvalho, Sette & Ferrari, 2016; Carvalho & Sette, 2017; Carvalho & Silva, 2016).

Although studies have been conducted to investigate the discriminant ability of IDCP-2 for specific conditions (e.g., borderline personality disorder, dependent personality disorder, bipolar disorder; Carvalho & Pianowski, 2019a; 2019b; Carvalho, Painwoski, & Gonçalves, 2018), no studies were found investigating its discriminant capacity for people with substance dependence. However, based on the literature (APA, 2013; Bornovalova et al., 2005; Kotov et al., 2017; Moraleda-Barreno, Díaz-Batanero, Pérez-Moreno, Gómez-Bujedo, & Lozano, 2018), it is possible to identify the conceptual relevant IDCP-2 factors for this

purpose: Anxious Concern, Hopelessness, Superiority, Dominance, Indifference, Anxiety, Depression, Risk-taking, Deceitfulness, and Impulsivity. Although these factors lack empirical evidence on substance dependence, previous studies found sound psychometric properties for them (Carvalho, 2018; Carvalho & Sette, 2017; 2015; Carvalho et al., 2016; Carvalho & Silva, 2016).

This study aimed to investigate the capability of IDCP-2 factors to identify people with substance dependence, as well as to examine their discriminant capacity in comparison to the Personality Inventory for DSM – 5 (PID-5; Krueger, Derringer, Markon, Watson & Skodol, 2011), a well-recognized scale in the field.

Three hypotheses were formulated : H1) the IDCP-2 factors should be able to discriminate the participants according to the level of substance dependence, especially the extreme groups (i.e., clinical group and general population group); H2) the factors representing the impulsiveness and anxiety traits should be the most discriminant (Bornovalova et al., 2005; Loree et al., 2015; Verdejo-García et al., 2008); and H3) the IDCP-2 factors should present a discriminant capacity for substance dependence superior or similar to the facets of PID-5.

Method

Participants

This is a quantitative study with correlational design (Creswell & Creswell, 2017). The sample was composed of 253 adults from the five regions of Brazil and selected by convenience, with 74.3% of the participants residing in the Southeast region. The sample was divided into three groups, namely, the group composed of people without a clinical diagnosis of substance dependence and who did not reach the cutoff in AUDIT and ASSIST (general population group); the risk group for substance dependence, composed of people without a clinical diagnosis of substance dependence, but who reached the cutoff in AUDIT and ASSIST (subclinical group); and the group of people with a clinical diagnosis of substance dependence (clinical group). Table 1 presents the main characteristics of the sample groups.

Measures

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; Henrique, Micheli, Lacerda, Lacerda & Formigoni, 2004). It is a structured questionnaire consisting of eight items on the use of psychoactive substances, such as tobacco, alcohol, marijuana, cocaine, stimulants, sedatives, inhalants, hallucinogens, and opiates. ASSIST evaluates the frequency of substance use, problems arising from use, concern about use by people close to you, impairment in performing tasks, difficulties to be abstinent, compulsion to use, and use by the injectable route. The score ranges from 0 to 20. Evidence indicates ASSIST as a psychometrically sound scale (Henrique et al., 2004). In our study, the reliability estimate was equal to .74 (Cronbach's alpha).

Alcohol Use Disorders Identification Test (AUDIT; Mendéz, 1999) AUDIT was developed by WHO as a screening tool for alcohol risk use. It consists of 10 items, whose total score ranges from 0 to 40. Evidence indicates AUDIT as a psychometrically sound scale (Lima et al., 2005; Santos, Gouveia, Fernandes, Souza, & Grangeiro, 2012). In this study, the reliability estimate was equal to .79.

Clinical Dimensional Personality Inventory - 2 (IDCP-2; Carvalho & Primi, in press) The IDCP-2 is a self-report scale to measure pathological traits, developed in Brazil. It's an updated version of the IDCP (Carvalho & Primi, 2015), based on PD models (e.g., APA, 2013; Clark, 1990; Krueger et al., 2011; Millon, 2011; Shedler & Westen, 2004). The IDCP-2 is composed of 206 items distributed in 12 dimensions, with a 4-point Likert-type response scale (1 = "has "nothing to do with me" and"4 = "has "a lot to do with me"). Previous studies indicated the validity of IDCP-2 factors (e.g. Carvalho, Pianowski, Silveira, Bacciotti, & Vieira, 2016; Carvalho et al., 2016; Carvalho & Sette, 2017; Carvalho & Silva, 2016).

Table 1.
Descriptive statistics of the sample groups

General Population	Subclinical	Clinical
n = 110	n = 119	n = 24
71.8% Female	61.,3% Female	83.3% Male
Age between 20 and 66	Age between 18 e 63 anos	Age between 19 e 59
(M = 32.3; SD = 10.1)	(M = 30.4; SD = 8.34)	(M = 36.4; SD = 11.2)
		25% Basic
58.2% Postgraduate	58.9% Graduated and Postgraduate	20.8% High School
		12.5% College student
55.5% Single	65.4% Single	41.7% Single
14.5% Psychiatric Treatment	37.8% Psychiatric Treatment	58.3% Psychiatric Treatment

For this study, the IDCP-2 factors associated with substance dependence were selected, based on the literature (APA, 2013; Belcher, Volkow, Moeller, & Ferré, 2014; Kotov et al., 2017; Moraleda-Barreno et al., 2018). The factors selected were: Anxious worry, Hopelessness, Superiority, Dominance, Indifference, Anxiety, Depression, Risk-taking, and Deceitfulness. The Risk-taking factor was administered in this study as an indicator of the impulsivity trait. The reliability for internal consistency ranged between .84 (Anxious worry and Indifference factors) and .92 (Depression and Risk taking factors)

Personality Inventory for DSM-5 (PID-5; Krueger et al., 2011). The PID-5 is a self-report scale that measures 25 facets of maladaptive personality traits described in section III of the DSM-5, which can be combined into five domains. The items should be responded on a 4-point Likert scale. Studies support the psychometric properties of PID-5, with Cronbach's alphas ranging from 0.72 to 0.96 (median 0.86) (Krueger et al., 2011).

The following facets, based on previous literature were selected (APA, 2013; Belcher et al., 2014; Kotov et al., 2017; Moraleda-Barreno et al., 2018): Irresponsibility, Deceitfulness, Manipulativeness, Risk-taking, Grandiosity, Anxiety, and Depression. The reliability by internal consistency varied between .74 (Risk-taking) and .84 (Depression).

Procedure

Data collection with the general population was performed online using Google Forms and invitations sent via social media (e.g., Facebook). Data collection with patients diagnosed with substance dependence was conducted at a drug addiction recovery clinic. Participants took about 30 minutes to complete the survey. Protocols for people under 18 and incomplete protocols were excluded. Data were extracted to the SPSS program for statistical analysis.

Data Analysis

A homogeneity test based on kurtosis and asymmetry was performed, with kurtosis values between 1 and -1 and asymmetry between 2 and -2 being acceptable (George & Mallery, 2010). Analysis of variance (ANOVA) was employed to compare groups in the factors of IDCP-2 and facets of PID-5. To verify the homogeneity assumption, the Levene test was used, which indicated the violation of the assumption for some comparisons. Although studies are demonstrating that ANOVA can be employed in cases where the normality of the data is not observed (Blanca Mena, Alarcón, Arnau Gras, Bono Cabré, & Bendayan, 2017), it was decided to use Welch's ANOVA, a variation of the classic ANOVA that can be applied for cases in which homogeneity is violated (Moder, 2007; 2010). *Post-hoc* analysis (Tukey method) was also performed to identify groups with significant differences. Two logistic regression analyzes were conducted (enter method). The first included the IDCP-2 factors and demographic variables sex, years of education, and age as independent variables, and the diagnosis of substance dependence as the dependent variable. The second was conducted with the PID-5 facets and the demographic variables as independent variables and the diagnosis as the dependent variable. It was chosen to conduct the two regression analyzes separately since the IDCP-2 factors with the PID-5 facets generated multicollinearity.

Ethical aspects

Prior contact was made with the rehabilitation clinic for data collection approval. The project was submitted to the Research Ethics Committee of *Universidade São Francisco*, being approved under CAAE 84826218.3.0000.5514. The study followed the guidelines and regulatory standards for research involving humans, based on Resolution No. 466, of December 12, 2012 (Ministério da Saúde & Conselho Nacional da Saúde, 2012).

Results

The assumptions for conducting ANOVA, i.e., independent samples, the similar variance between groups, and distribution close to normal were achieved, according to the criteria presented in the literature (George & Mallery, 2010). The Hopelessness factor presented kurtosis slightly higher than the threshold (kurtosis = 1.25). Levene's test indicated that most of the factors in this study did not show homogeneity of variance. Only Anxious Concern, Dominance, Indifference, and Anxiety factors showed homogeneity of variance. Empirical evidence indicates that, even in these cases, it is possible to use ANOVA (Blanca Mena et al., 2017). However, it was chosen to use Welch's ANOVA, a variation of the classic ANOVA, that can be employed for cases in which homogeneity is violated (Moder, 2007; 2010).

Analyzes of variance were performed to verify the differences between the sample groups in the IDCP-2 factors. All factors showed statistically significant differences: Anxious Worry [F (2, 67) = 16.448; p < .001], Hopelessness [F (2, 61) = 18.330; p < .001], Superiority [F (2, 59) = 9,200; p < .001], Dominance [F (2.63) = 4.704; p = .01], Indifference [F (2, 63) = 10,198; p < .001], Anxiety [F (2.69) = 11.631; p < .001], Depression [F (2, 65) = 7.838; p < .001], Risk-taking [F (2, 57) = 27.358; p < .001], and Deceitfulness [F (2.61) = 20.003; p < .001]. In order to

Table 2.
ANOVA's Post Hoc test – sample groups and IDCP-2 factors

	Anxious Worry			Hopelessness		Superiority	
Groups	1	2	3	1	2	1	2
General population (n = 110)	2.22 (.78)			1.31 (.54)		1.57 (.59)	
Subclinical (n = 119)		2.60 (.77)			1.78 (.88)	1.78 (.83)	
Clinical (n = 24)			3.11 (.71)		2.09 (.85)		2.44 (1.0)
	Risk-taking			Indifference		Anxiety	
Groups	1	2	3	1	2	1	2
General population (n = 110)	1.24 (.40)			1.47 (.62)		2.29 (.96)	
Subclinical (n = 119)		1.70 (.73)		1.67 (.65)			2.81 (.84)
Clinical (n = 24)			2.18 (.89)		2.16 (.71)		3.00 (.76)
	Deceitfulness			Dominance		Depression	
Groups	1	2	3	1	2	1	2
General population (n = 110)	1.37 (.44)			2.05 (.72)		1.65 (.78)	
Subclinical (n = 119)		1.70 (.61)		2.27	2.27 (.72)	2.03	2.03 (.99)
Clinical (n = 24)			2.10 (.65)		2.51 (.79)		2.26 (.88)

Note. α = .05; intragroups p-value was non-significant (.089-1.0); inside brackets the standard deviation values.

find out which groups differed, Table 2 presents Tukey's post hoc analysis.

The groups were discriminated with the Anxious Worry, Risk-taking, and Deceitfulness factors, with the clinical group presenting higher means and the general population group with lower means. The factors Hopelessness and Anxiety were able to discriminate the clinical and subclinical group from the general population. The factors Superiority and Indifference differentiated the clinical group, which had higher means, the subclinical group, and the general population. In the Dominance and Depression factors, two groups were separated, general population and clinical groups, with the latter presenting higher means.

In order to verify the predictive capacity of the IDCP-2 factors for substance dependence, logistic regression was employed with only the general population (n = 110) and clinical (n = 24) groups, as can be seen in Table 3. In the first model, the IDCP-2 factors were used as independent variables and a dichotomous variable, presence or no presence of substance dependence, was the dependent variable. A second regression model was conducted only with the independent variables that presented a significant single contribution in the first model.

Model 1 was able to predict 77% of the group variable. The variables with statistically significant contributions were Sex and the Hopelessness factor of IDCP-2. This model was able to correctly identify 82.6% of people in the clinical group and 100% of people in the general population group. Model 2, including variables with a single contribution in the first model, was able to predict 56% of the group variable. This model was able to identify 58.3% of the clinical group and 97.3% of the non-clinical group, indicating that the first model provides information that improves the ability to identify the groups. Table 4 presents the logistic regression analysis with the PID-5.

The model with the PID-5 facets as independent variables was able to predict 76% of the group variable, similar to what was observed with the IDCP-2 factors. In this model, sex was also significant, in addition to the Anxiety facet. This

Table 3.
Logistic regression analysis – IDCP-2 factors and dichotomous variable of substance dependence

Model 1					
IDCP-2	*B*	EP	*p*	Exp(*B*)	Nagelkerke r^2
Anxious Worry	.04	.96	.97	1.04	.77
Hopelessness	**2.31**	**1.07**	**0.03**	**10.11**	
Superiority	.65	.73	.37	1.91	
Dominance	-.50	.86	.56	.61	
Indifference	.14	.78	.86	1.15	
Anxiety	-.27	.88	.76	.76	
Depression	-.06	1.01	.95	.94	
Risk-taking	1.31	.83	.11	3.69	
Deceitfulness	1.09	.97	.26	2.97	
Age	.04	.05	.37	1.05	
Sex	**2.79**	**1.24**	**.02**	**16.24**	
Years of education	-1.01	.74	.17	.36	
Model 2					
	B	EP	*p*	Exp(*B*)	Nagelkerke r^2
Hopelessness	2.29	.54	$p < .01$	18.08	.56
Sex	4.07	1.03	$p < .01$	15.43	

Note. In bold, the significant independent variables in the model.

Table 4.
Logistic regression analysis – PID-5 factors and dichotomous variable of substance dependence

PID-5	*B*	S.E	*p*	Exp(*B*)	Nagelkerke r^2
Irresponsibility	.11	.13	.43	1.11	
Deceitfulness	-.03	.11	.78	.97	
Manipulativeness	.15	.18	.39	1.17	
Risk-taking	.18	.09	.06	1.19	
Grandiosity	.14	.12	.24	1.15	.76
Anxiety	**.20**	**.10**	**.04**	**1.22**	
Depression	.03	.05	.55	1.03	
Age	.08	.05	.13	1.08	
Sex	**2.02**	**.93**	**.03**	**7.55**	
Years of education	-1.17	.63	.06	.309	
Model 2					
	B	S.E	*p*	Exp(*B*)	Nagelkerke r^2
Anxiety	.20	.05	$p < .01$	1.22	.50
Sex	3.13	.71	$p < .01$	22.89	

Note. in bold, the significant independent variables in the model.

model was able to correctly identify 78.3% of people in the clinical group, and 100% of people in the general population group. Model 2, including only variables significant in the first model, was able to predict 50% of the group variable. This model was able to correctly identify 54.2% of people in the clinical group and 95.5% in the non-clinical group.

Discussion

This study aimed to verify the contribution of the IDCP-2 self-report scale in the identification of people with substance dependence and to compare their predictive capacity with PID-5. The findings of this study confirmed the initial hypotheses: H1) the IDCP-2 factors were capable of differentiating the groups, especially the extreme groups, i.e., general population and clinical group; H2) the Risk-taking factor, representing the impulsiveness trait, and the two factors related to anxiety (Anxious Worry and Anxiety factors) were those with the best performance in discriminating groups; and, H3) similar results (r^2) were observed between IDCP-2 and PID-5 in the predictive capacity of substance dependence. The hypotheses are discussed in the following paragraphs.

The IDCP-2 factors were able to discriminate between the general population and the clinical group. These findings are in agreement with the literature that lists hopelessness, superiority, dominance, indifference, anxiety, depression, impulsivity, and manipulation as characteristics of drug addicts (APA, 2013; Kotov et al., 2017; Moraleda-Barreno et al., 2018). It was also observed that the Risk-taking factor, representing the impulsiveness trait in this study, and the factors Anxiety and Anxious Worry, showed greater differences between the general population and clinical groups. This finding confirms previous evidence indicating that Impulsiveness and Anxiety traits as the most relevant for discriminating people with substance dependence (Belcher et al., 2014; Ersche, Turton, Pradhan, Bullmore, & Robbins, 2010; Grant et al., 2004; Lai, Cleary, Sitharthan, & Hunt, 2015; Mitchell & Potenza, 2014; Moraleda-Barreno et al., 2018;). These results confirm the H1 and H2 of our study.

As for the third hypothesis of this study (H3), the predictive capacity for substance dependence on the IDCP-2 factors was similar to the capacity of the PID-5 facets. The findings suggest that the scores of IDCP-2 and PID-5 are capable of predicting, respectively, 77% and 76% of the sample groups. In IDCP-2, the only significant factor in the model was Hopelessness. This factor concerns feelings of sadness, discouragement, and suicidal thoughts (Carvalho & Primi, in press), representing traits frequently identified in drug addicts (Baines, Jones, & Christiansen, 2016; Karamat & Ahmed, 2015). Although coherent, it was expected that other factors of IDCP-2 would show discriminant capacity with a similar or higher weight to the Hopelessness factor. Future studies should verify whether the findings of the present research are replicated. The PID-5 presented only the Anxiety facet as significant in the regression analysis. This facet represents the exaggerated concern about the possibility of uncomfortable events in the future that may or may not happen (Krueger et al., 2011). Studies have found that groups of drug addicts have higher levels of anxiety compared to the general population (Belcher et al., 2014, Grant et al., 2004; Lai et al., 2015).

The findings of this study are preliminary evidence indicating that the IDCP-2 factors are capable of identifying people with substance dependence. It was observed that Risk-taking, Anxious Worry, and Anxiety factors were the best for discriminating people with substance dependence from individuals who reported not having this diagnosis. These factors were also discriminant to correctly identify people without a diagnosis of substance dependence but were characterized as a risk group by the AUDIT and ASSIST scales.

The findings should be weighted according to the major methodological limitations of this study. First, the sample size of the groups was very distinct, the distribution of demographic variables was uneven (e.g., sex), and information was not accessible on the most used type of chemical substance and the form of administration (e.g., injectable, inhaled). Second, most of the clinical sample was being treated at a rehabilitation clinic, which may have mitigated responses to the scales. Third, attention is called on the use of the Risk-taking factor of IDCP-2, as representative of the impulsivity trait. Future studies should investigate the application of the IDCP-2 Impulsivity factor for this purpose. Although the findings of this study are promising, they should be considered as preliminary to the use of specific factors from IDCP-2 to identify people with substance dependence. Future studies must verify whether these findings are replicated in samples, especially designs with larger clinical samples.

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