Published in final edited form as:

J Pers Disord. 2015 February ; 29(1): 131–144. doi:10.1521/pedi_2013_27_081.

The Psychometric Properties of the Iowa Personality Disorder Screen in Methadone-Maintained Patients: An Initial Investigation

Mark Beitel, Ph.D.^{a,b}, Skye Peters, B.A.^b, Jonathan D. Savant, B.S.^b, Christopher J. Cutter, Ph.D.^{a,b}, John J. Cecero, Ph.D.^c, and Declan T. Barry, Ph.D.^{a,b}

^aYale University School of Medicine, New Haven, CT

^bAPT Foundation Pain Treatment Services, New Haven, CT

^cFordham University, Bronx, NY

Abstract

The psychometric properties of the Iowa Personality Disorder Screen (IPDS) were examined in 150 methadone-maintained patients who completed measures of demographic, psychopathology, substance use, pain, and methadone maintenance treatment (MMT) characteristics. An exploratory factor analysis revealed a two-factor solution that explained 45 percent of the scale variance. The first factor captured internalizing tendencies, such as inhibition and hypersensitivity to others. The second factor comprised externalizing tendencies, such as impulsivity and insensitivity to others. The IPDS item subsets, derived factors, and the total score were significantly related to race/ethnicity but not sex. The effects of race/ethnicity were controlled statistically when the IPDS was compared to other measures of psychopathology, self-reported substance use, pain variables, and MMT characteristics. In general, the IPDS appears to be reliable and valid for use with methadone-maintained patients. The two-factor structure found in this study may have clinical utility and merits further investigation in other MMT samples.

Keywords

Iowa Personality Disorder Screen; methadone; pain; psychometrics

Introduction

While personality disorders (PDs) occur in approximately nine percent of the general U.S. population (Lenzenweger, Lane, Loranger, & Kessler, 2007), they are much more prevalent in opioid dependent patients¹, with estimates ranging from 50–90% (Calsyn, Felming, Saxon, & Wells, 1996; Craig & Weinberg, 1992; Koenigsberg, Kaplan, Gilmore, & Cooper, 1985; Rounsaville et al., 1998; Teplin, O'Connell, Daiter, & Varenbut, 2004). Among

Address correspondence to: Declan T. Barry, Ph.D., Yale University School of Medicine, CMHC/SAC Room 220, 34 Park Street, New Haven CT 06519-1187. declan.barry@yale.edu.

¹In this manuscript, the terms “opioid dependence” and “opioid dependent” are used in accordance with the *Diagnostic and statistical manual of mental disorders (4th edition, text revision) DSM-IV-TR* (APA, 2000).

patients in methadone maintenance treatment (MMT)—a mainstay treatment in the U.S. for individuals with opioid dependence—standardized clinical interview data have yielded PD prevalence rates above 60% (Cacciola, Rutherford, Alterman, McKay, & Snider, 1996). While antisocial personality disorder (ASPD) appears to be the most prevalent PD in MMT patients (with lifetime prevalence rates as high as 60% (Darke, Hall, & Swift, 1994)), other Cluster B (borderline, narcissistic, histrionic) as well as avoidant and paranoid PDs frequently occur in MMT patients, but often by an order of magnitude less than ASPD (Cacciola et al., 1996; Rounsaville et al., 1998).

PDs in MMT patients are associated with a variety of psychosocial problems, including increased DSM-IV Axis I psychopathology (American Psychiatric Association, 1994; Ball & Cecero, 2001; Calsyn et al., 1996), decreased interpersonal functioning (Ball & Cecero, 2001; Calsyn et al., 1996), and higher unemployment (Calsyn et al., 1996), as well as increased likelihood of HIV risk behaviors (IV drug use, needle sharing) and HIV infection (Brunner, Greenfield, Schmidt, & Bigelow, 1993; Calsyn et al., 1996; Gill, Nolimal, & Crowley, 1992). While the presence of a PD may complicate the provision of MMT (Cacciola et al., 1996; Nace & Davis, 1993), patients with personality disorders can be retained and benefit from MMT (Ball, 2007; Cacciola et al., 1996; Gerstley et al., 1989).

PDs in MMT patients have been assessed by clinical interview (Rounsaville et al., 1998), psychological testing (Craig, 1982; Craig & Weinberg, 1992; Murray, McHugh, Behar, Pratt, & Otto, 2008), and retrospective chart review (Koenigsberg et al., 1985). Each of these methods is time and labor intensive for the clinician, patient, or both. A brief clinician-administered screening measure of PDs would facilitate research and would aid case conceptualization and treatment planning. However, only a few such measures exist: the Standardised Assessment of Personality, Abbreviated Scale (SAPAS; (Moran et al., 2003)), the Social Conformism Scale (SCS; (Pfohl, Blum, & Zimmerman, 1997)), the Rapid Personality Assessment Schedule (RPAS; (Van Horn, Manley, Leddy, Cicchetti, & Tyrer, 2000)), and the Iowa Personality Disorder Screen (IPDS; (Langbehn et al., 1999)). The SAPAS has shown sensitivity (94 percent) and specificity (85 percent) comparable to the IPDS in general psychiatric samples. The RPAS has demonstrated adequate, but lower, diagnostic efficiency rate when compared to its parent instrument (sensitivity = 64 percent, specificity = 82 percent). The SAPAS and SCS have been used with MMT patients (Carpentier et al., 2009; Hesse, Rasmussen, & Pedersen, 2008). The psychometric properties of the IPDS in MMT samples have not yet been examined to our knowledge.

Items for the IPDS were culled from a large database ($N = 1,203$) of structured personality disorder interviews conducted at six sites around the world (see Table 2 for items). Authors of one study (Germans, Van Heck, Langbehn, & Hodiamont, 2010) examined the factor structure of the IPDS (11-item, self-report version) in a Dutch sample: They found evidence for a three-factor solution, which explained 57.5 percent of the variance. However, one factor contained only two items. Providing evidence for concurrent validity, the 11-item measure (in self-report format) was highly correlated with other PD screeners such as one derived from the Inventory of Interpersonal Problems (IIP-PD; $r = .77$) (Pilkonis, Kim, Proietti, & Barkham, 1996) and the Temperament and Character Inventory (TCI-SD; $r = -$.

74) (Cloninger, Przybeck, Svrakic, & Wetzel, 1994) in a large sample ($N = 624$) of psychiatric and non-psychiatric participants (Morse & Pilkonis, 2007).

In addition to the 11-item measure, 5-, 6-, and 7-item subsets have been identified in previous research with psychiatric patients (Langbehn et al., 1999). Items 1 through 6 were initially conceived as a brief screen and performed fairly well, with a cutoff of three positive items, in identifying PDs in non-psychotic spectrum inpatients and outpatients: sensitivity (75 percent) and specificity (82 percent) (Langbehn et al., 1999). A 5-item subset (items 4 through 8) appeared to be promising as well, with good sensitivity (92 percent) and specificity (79 percent), using a two-item cutoff. A subset of 7 items demonstrated good sensitivity (79 percent) and specificity (86 percent) with a 3-item cutoff. Trull and Amdur found that diagnostic efficiency was optimal with the 7-item subset (1, 3–8) in a non-clinical replication study (sensitivity = 69 percent, specificity = 91 percent) (Trull & Amdur, 2001). More recently, researchers have employed a self-report format for the IPDS. Diagnostic efficiency estimates have been somewhat lower in these studies (Germans et al., 2010; Morse & Pilkonis, 2007; Olsson, Øystein, & Dahl, 2011). It is important to note that the interview format was used in the present study.

The IPDS has several properties that suggest promise as a clinical screening tool in MMT. First, the IPDS has been suggested for use with MMT patients because it is a brief screening interview that exhibits excellent sensitivity (92 percent) and good specificity (72 percent) in general psychiatric samples (Hesse et al., 2008). Second, the IPDS was derived primarily from the Structured Interview for DSM-IV Personality (SIDP-IV) (Pfohl, Blum, & Zimmerman, 1995), which facilitates diagnostic correspondence with the DSM-IV. Third, the 11-item IPDS provides relatively rich PD cluster-level information, since it contains multiple items within each cluster. The authors encourage the use of the 11-item measure (and not solely the briefer item subsets) in novel settings (Langbehn et al., 1999).

Whereas we previously reported on a) the prevalence of pain and associated substance use and psychiatric correlates, b) prior pain treatment utilization, and c) perceptions of stress reduction interventions among the study sample, we did not report on findings related to the psychometric properties of the IPDS (Barry et al., 2011; Barry, Beitel, Cutter, et al., 2009; Barry, Beitel, Garnet, et al., 2009). Given the high rates of PD in MMT patients, it is important to examine promising screening tools carefully. Therefore, the primary aim of the present study was to examine the factor structure, internal reliability, and concurrent validity of the IPDS. Concurrent validity was assessed by examining the relationship between the IPDS and clinical variables, including Axis I pathology (depression, self-harm, emotional lability, psychotic symptoms, alcohol/drug use), interpersonal relations, physical pain, and MMT characteristics. The Axis I variables were selected because of their relatively high prevalence in MMT patients.

Method

Participants

As reported in a previous paper (Barry, Beitel, Garnet, et al., 2009), participants were 150 opioid-dependent patients, 85 men and 65 women, aged 19 to 61 years ($M, 41.5$; $SD, 10.2$),

who were in treatment for at least six months ($Mdn = 24$; $Q_1 = 12$; $Q_3 = 60$) at one of three opioid agonist treatment programs operated by the APT Foundation, Inc. (hereafter referred to as APT), a private not-for-profit community-based organization located in New Haven, CT. Please see Table 1 for demographic information. At the beginning of data collection, APT had a census of approximately 1,500 MMT patients. Participants were predominantly Caucasian (58 percent), male (57 percent), never married (53 percent), and unemployed (43 percent) or disabled (29 percent). A majority of participants had at least a high school level of education (68 percent). All participants had at least one prior MMT episode; the frequency of prior MMT episodes ranged from 1 to 15 ($Mdn = 2$; $Q_1 = 1$; $Q_3 = 3$). Of the 150 participants, 108 reported experiencing some form of current physical pain.

Measures

Demographics and MMT Characteristics—Respondents provided information about demographics (age, sex, race/ethnicity, employment status, educational level, relationship status) and MMT characteristics (months enrolled, number of different treatment episodes, current methadone dose).

Behavior and Symptom Identification Scale (BASIS-24; (Eisen, Normand, Belanger, Spiro III, & Esch, 2004))—The BASIS-24 is a twenty-four item, self-report measure designed to assess psychiatric symptoms and functioning across six areas: Depression, Interpersonal Relationships, Self-Harm, Emotional Lability, Psychotic Symptoms, and Alcohol/Drug Use (Eisen, Normand, & Belanger, 2004). The reliability and validity of the BASIS-24 has been established in different clinical samples, including those with substance use disorders (Cameron et al., 2007; Eisen, Normand, Belanger, et al., 2004).

Iowa Personality Disorder Screen (IPDS; (Langbehn et al., 1999))—The IPDS is an 11-item mini-structured interview that can be administered in five minutes. It was designed to detect the presence of personality disorders quickly and efficiently. Sensitivity and specificity estimates in psychiatric samples have been high (Langbehn et al., 1999). Each item is scored 0 or 1 to indicate absence or presence. Items are then summed to create a total score. Various PD cut-off scores have been identified and applied to the total score; for example, two or three positive items have been used as cut-off thresholds in previous research.

Pain Characteristics—Participants rated three facets of pain experienced in the past seven days (i.e., “pain at its worst,” “pain at its least,” and “typical level of pain”) on an 11-point scale (0 to 10) (BPI; (Cleeland, 1991; Cleeland & Ryan, 1994)). In addition, they completed three pain interference items (scored on a scale from 0 to 10) from the BPI that assessed the extent to which their pain in the last seven days had interfered with their “everyday life,” “normal work,” and “relationships with other people.”

Procedure

Participants were self-selected in response to study fliers posted at APT clinics from March 2007 to March 2008. While APT has a primary care clinic that offers routine and specialty medical care (e.g., HIV, hepatitis), it did not provide specialty pain diagnostic or treatment

services during the period in which the data was collected. As previously reported (Barry, Beitel, Garnet, et al., 2009), among the 150 study participants, 37% had “chronic severe pain” (i.e., pain lasting at least 6 months with moderate to severe pain intensity or significant pain interference), 39% had “some pain” (i.e., pain reported in the past week but not chronic severe pain), and 24% reported no pain in the past week. All patients who spoke with a research assistant agreed to participate and completed the survey. Surveys took approximately 45 minutes to complete and were conducted face-to-face in a confidential setting. Participants were unaware of the specific aims of the study. Fliers indicated that the study “aims to better understand patients’ experiences and treatment needs.” Participants were compensated \$10 for study participation. The study received appropriate institutional Human Investigation Committee approval.

Data Analysis

Psychometric properties of the IPDS were investigated with generalized linear model (GLM) strategies for continuous data (ANOVA, *t*-test, Product-Moment correlation), Pearson chi-square tests for frequency data, as well as exploratory factor analysis (EFA) involving Varimax rotation and categorical principal components analysis (CATPCA) to assess factor structure. Bonferroni corrections were employed, where appropriate, to maintain a familywise error rate of .05 for multiple comparisons. Potential demographic, diagnostic, and treatment-related differences on the IPDS were assessed with strategies for continuous and categorical data (ANOVA, *t*-test, Product-Moment correlation). Statistical significance was set to $p < .05$. Statistical analyses were performed with SPSS Version 17.0 for Windows (SPSS, Inc., Chicago, IL).

Results

Scale and item descriptive statistics are presented in Table 2. Each item is identified by the PD with which it is most closely associated and by the cluster into which that disorder falls.

Structure

Two components emerged from the EFA (see Table 2), both of which had Eigenvalues greater than one. Together, the two components explained 45 percent of the variance in the scale. The first factor could be described as an internalizing, interpersonally-sensitive factor and is defined by the presence of social anxiety and reticence. Factor 1 contains six items, two from clusters A (paranoid), B (borderline), and C (avoidant). Factor 2 could be described as an externalizing or interpersonally-insensitive dimension and is defined by the need for immediate gratification and self-importance. Four out of the five items are associated with cluster B: two are reflective of histrionic PD and two reflect narcissism. The fifth item is associated with paranoia.

To further explore the structure of the IPDS, the data were subjected to CATPCA, a method that is well-suited to categorical data. The CATPCA procedure replicated the findings of the EFA by separating the internalizing items from the externalizing items on Dimension 2 (see Figure 1). The figure shows how the items relate to one another across a spectrum from internalizing to externalizing. It is interesting to note that all 11 items loaded $> .30$ on the

first Dimension in the analysis. This suggests that the IPDS might have one superordinate factor (PDs in general) and two subordinate factors (internalizing and externalizing).

Demographics

Various tests were run to determine the extent of demographic influences on the IPDS. Age was not linearly related to the IPDS factor, item subsets, or total scores, as assessed with Pearson Product-Moment correlation analyses. Participants scoring above the IPDS 7-item cut-off score ($n_{below} = 68$, $n_{above} = 82$) did not differ statistically on age from those scoring below the cut-off ($t = 1.04(148)$, $p > .05$). The potential effects of sex and race/ethnicity on the IPDS total score were investigated with an analysis of variance strategy. The main effect for sex was not statistically significant at the .05 level; however, the main effect for race/ethnicity was significant ($F(2, 147) = 5.74$, $p < .01$), with Latino participants scoring highest and Black participants scoring lowest on both factors and the IPDS total score. The interaction between sex and race/ethnicity was not significant. This same pattern emerged for the IPDS factor scores. In addition, potential sex and race/ethnicity effects were assessed for the 7-item IPDS cut-off groups (where a score of 3 or more is considered positive and a score of 2 or less is considered negative): Chi-square statistics were not significant for sex but were for race/ethnicity ($\chi^2(2)8.65$, $p < .05$) with Latinos having the highest proportion of IPDS positives and Blacks having the lowest proportion of IPDS positives. Consequently, all subsequent analyses were run controlling for race/ethnicity as a covariate.

Axis I Pathology and Interpersonal Relations

Dimensions of mental health were assessed with the BASIS-24 (Eisen, Normand, Belanger, et al., 2004). Partial correlations controlling for race/ethnicity were run for the IPDS (factors, 5-, 6-, and 7-item subsets, and total score) and BASIS-24 (subscales and total score). The IPDS factors, item subsets, and total score were positively related to all BASIS-24 subscales and total scale (see Table 3), with correlations ranging from .18 to .66. In addition, mean differences by the 7-item IPDS cut-off score were assessed with MANOVA ($F(6, 139) = 14.80$, $p < .001$), indicating a significant difference overall with the IPDS positive group scoring significantly higher on all BASIS-24 subscales ($p < .01$ for all variables but alcohol/drug use, which was significant at $p < .05$).

Pain Indices

Partial correlations controlling for race/ethnicity were run for the IPDS factors and the pain intensity and interference measures. The IPDS Factor 1 (Internalizing) and the IPDS total score were positively related to most of the pain measures, while Factor 2 (Externalizing) was mostly unrelated to the pain measures, with the exception of interference in relationships, which was significant (see Table 4). In addition, mean differences by 7-item IPDS cut-off score group were assessed with MANOVA ($F(6, 139) = 4.50$, $p < .001$), indicating a significant difference overall with the IPDS positive group scoring significantly higher on all pain indicators ($p < .01$) for all variables.

Methadone Maintenance Treatment Characteristics

Three MMT characteristics were examined to assess their possible impact on the IPDS (see Table 4). Neither methadone dose, months of treatment, nor number of previous treatments were significantly related to the IPDS total score, as assessed by partial correlation controlling for race/ethnicity. However, partial correlations indicate that months of methadone treatment was significantly and positively related to the internalizing factor of the IPDS ($r(148) = .26, p < .01$) and to the 5- and 7-item subsets ($r(148) = .24, p < .05$ and $r(148) = .20, p < .05$). None of the methadone variables were related to the externalizing factor. To assess differences in participants above and below the IPDS 7-item cutoff score, a MANOVA was run with the methadone treatment variables as dependent variables. A statistical difference was detected overall ($F(3, 142) = 3.00, p < .05$). Of the three variables, only months of methadone treatment showed a difference by the 7-item IPDS cut-off score ($F = 5.4, p < .05$), with the IPDS positive group showing more months of methadone treatment, 54 months as compared to 32 months.

Discussion

The primary aim of this study was to investigate the psychometric properties of the Iowa Personality Disorder Screen (IPDS) in methadone-maintained patients. To that end, we examined the factor structure, internal reliability, and concurrent validity of the IPDS. Concurrent validity was assessed by examining the relationship among the IPDS, Axis I symptoms, interpersonal relations, physical pain, and MMT characteristics.

An exploratory factor analysis revealed two clinically-useful factors, defined by internalizing and externalizing tendencies. This typology is well-known in clinical work and in substance abuse research (Chan, Dennis, & Funk, 2008). The first factor reflected an internalizing, interpersonally-sensitive dimension and was defined by the presence of social anxiety and reticence. Factor 1 contained items from cluster A (paranoid), B (borderline), and C (avoidant) PDs. Factor 2 represented an externalizing or interpersonally-insensitive dimension and was defined by the need for immediate gratification and self-importance. Most of the items were associated with cluster B (histrionic and narcissistic) PDs. One item was associated with paranoia. This structure was also identified with categorical principal components analysis (CATPCA), whereby the internalizing items were separated from the externalizing items. The mean total score for the internalizing factor was more than 1.5 times greater than the mean for the externalizing factor, suggesting a noticeably higher prevalence of internalizing symptoms in this particular sample. This factor structure differs from the one identified by Germans et al. (2010) in terms of number of factors and by factor content. Differences, however, should not be surprising because of variability in instrumentation (self-report versus interviewer-administered), language (Dutch versus English), sample (community mental health versus MMT), and culture (The Netherlands versus the United States).

Clinically-relevant correlates were also examined to establish concurrent validity for the instrument. Our findings indicate that the IPDS and its factors were significantly correlated with psychiatric distress and self-reported substance use, as measured by the BASIS-24. These findings are consistent with those of Ball and Cecero (Ball & Cecero, 2001), who

explored normal personality traits (Costa & McCrae, 1992), early maladaptive schemas, and PDs in MMT patients. In their study of 41 MMT patients, ASPD diagnosis was associated with decreased agreeableness and with increased schemas of mistrust/abuse, vulnerability to harm, and emotional inhibition. ASPD was also associated with increased neuroticism and subjugation, as well as decreased extraversion and openness.

The IPDS showed strong relations with physical pain variables. Both pain intensity (least and typical) and pain interference (life, work, and relationships) were associated with the IPDS total score and with Factor 1. Factor 2 did not show linear associations with pain variables, with the exception of relationship interference. This finding supports previous research linking internalizing disorders (e.g., anxiety, depression) and pain experience (Polatin, Kinney, Gatchel, Lillo, & Mayer, 1993).

Whereas the overall IPDS was not significantly associated with MMT characteristics, such as dose, months of treatment, or number of previous treatments, Factor 1, as well as the 5- and 7-item subset scores, were significantly and positively related to months of treatment. These findings support prior research indicating that MMT patients with PDs can be retained in treatment (Ball, 2007; Cacciola et al., 1996; Gerstley et al., 1989).

Clinical Implications

Since the ability to form a therapeutic alliance has been shown to be positively related to treatment outcome in MMT patients with personality disorders (Gerstley et al., 1989), the early identification of PD status might help clinicians plan for and manage possible alliance issues from the beginning of treatment. The IPDS appears to be a promising clinical tool in this regard and further examination of its psychometric properties in other MMT samples (including those with pain), in addition to its association with measures of therapeutic alliance, is warranted. MMT patients with PDs require special care; hence, various psychotherapeutic approaches have been developed for this difficult-to-treat population. One such approach was developed by Wagner and colleagues (Wagner, Miller, Greene, & Winiarski, 2004) who adapted Dialectical Behavior Therapy for use with MMT patients with borderline PD. Ball developed Dual Focus Schema Therapy (Ball, 1998) to address the full range of PDs in MMT. If upon further investigation, the IPDS demonstrates robust psychometric properties in different MMT patient samples, its routine use in MMT settings would potentially allow clinicians and program planners to selectively offer treatment that specifically addresses the needs of MMT patients with PDs.

Limitations

This study has several limitations. First, the IPDS and other measures were administered by specially trained research assistants and not by masters- or doctoral-level clinicians. Second, no “gold standard” PD interview was included in the design; so, we were unable to calculate sensitivity and specificity data. Third, the IPDS does not contain any items that directly assess antisocial personality disorder (ASPD), which is one of the most prevalent PDs in MMT (Darke et al., 1994). However, it should be noted that the IPDS was capable of detecting ASPD in SCID-II-diagnosed patients in a community mental health setting (15 of 20 patients, or 75 percent of the sample) (First, Gibbon, Spitzer, Williams, & Benjamin,

1997; Germans et al., 2010). Fourth, participant recruitment relied upon self-selection, which increases the possibility of sampling bias. Patients who chose not to participate might differ from participants in some important ways.

Future Research

The factor structure of the IPDS will need to be systematically investigated in larger MMT samples. Once large datasets are obtained, then confirmatory factor analytic procedures could be implemented to address questions such as factorial invariance. Racial/ethnic differences should also be evaluated and these studies might benefit from including varied methodological techniques such as differential item functioning. The internalizing/externalizing personality framework should be explored in greater detail. Specifically, the relationship of Factor 2 and pain experience should be investigated in a larger sample. The promising findings from the present study suggest that further investigation of the IPDS in MMT is warranted. Specifically, future research should examine the convergent and discriminant validity of this instrument as well as its association with treatment processes (e.g., session attendance) and outcome variables (e.g., urinalysis findings).

Acknowledgments

This research was supported by funding from the APT Foundation, Inc. and the National Institute on Drug Abuse to Dr. Barry (K23 DA024050).

References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author; 1994.
- Ball SA. Manualized treatment for substance abusers with personality disorders: Dual Focus Schema Therapy. *Addictive Behaviors*. 1998; 23:883–891. [PubMed: 9801723]
- Ball SA. Comparing individual therapies for personality disordered opioid dependent patients. *Journal of Personality Disorders*. 2007; 21:305–321. [PubMed: 17536942]
- Ball SA, Cecero JJ. Addicted patients with personality disorders: Traits, schemas, and presenting problems. *Journal of Personality Disorders*. 2001; 15:72–83. [PubMed: 11236816]
- Barry DT, Beitel M, Breuer T, Cutter CJ, Savant J, Schottenfeld RS, et al. Conventional and unconventional treatments for stress among methadone-maintained patients: Treatment willingness and perceived efficacy. *American Journal on Addictions*. 2011; 20:137–142. [PubMed: 21314756]
- Barry DT, Beitel M, Cutter CJ, Garnet B, Joshi D, Schottenfeld RS, et al. Allopathic, complementary, and alternative medical treatment utilization for pain among methadone-maintained patients. *American Journal on Addictions*. 2009; 18:379–385. [PubMed: 19874157]
- Barry DT, Beitel M, Garnet B, Joshi D, Rosenblum A, Schottenfeld RS. Relations among psychopathology, substance use, physical pain experiences in methadone-maintained patients. *Journal of Clinical Psychiatry*. 2009; 70:1213–1218. [PubMed: 19607760]
- Brooner RK, Greenfield L, Schmidt CW, Bigelow GE. Antisocial personality disorder and HIV infection among intravenous drug abusers. *American Journal of Psychiatry*. 1993; 150:53–58. [PubMed: 8417580]
- Cacciola JS, Rutherford MJ, Alterman AI, McKay JR, Snider EC. Personality disorders and treatment outcome in methadone maintenance patients. *The Journal of Nervous and Mental Disease*. 1996; 184:234–239. [PubMed: 8604033]
- Calsyn DA, Felming C, Saxon AJ, Wells EA. Personality disorder subtypes among opiate addicts in methadone maintenance. *Psychology of Addictive Behaviors*. 1996; 10:3–8.

- Cameron IM, Cunningham L, Crawford JR, Eagles JM, Eisen SV, Lawton K, et al. Psychometric properties of the BASIS-24© (Behaviour and Symptom Identification Scale-Revised) Mental Health Outcome Measure. *International Journal of Psychiatry in Clinical Practice*. 2007; 11:36–43. [PubMed: 24941274]
- Carpentier PJ, Krabbe PF, van Gogh MT, Knapen LJ, Buitelaar JK, de Jong CA. Psychiatric comorbidity reduces quality of life in chronic methadone maintained patients. *American Journal on Addictions*. 2009; 18:470–480. [PubMed: 19874168]
- Chan Y-F, Dennis ML, Funk RR. Prevalence and comorbidity of major internalizing and externalizing problems among adolescents and adults presenting to substance abuse treatment. *Journal of Substance Abuse Treatment*. 2008; 34:14–24. [PubMed: 17574804]
- Cleeland, CS. Pain assessment in cancer. In: Osaba, D., editor. *Effect of cancer on quality of life*. Boca Raton: CRC Press; 1991. p. 293-305.
- Cleeland CS, Ryan KM. Pain assessment: Global use of the Brief Pain Inventory. *Annals of the Academy of Medicine Singapore*. 1994; 23:129–138.
- Cloninger, CR.; Przybeck, TR.; Svrakic, DM.; Wetzell, RD. *The Temperament and Character Inventory (TCI): A guide to its development and use*. St. Louis: Washington University, Center for Psychobiology of Personality; 1994.
- Costa, PT.; McCrae, RR. *Revised NEO Personality Inventory and NEO Five Factor Inventory*. Odessa, FL: Psychological Assessment Resources; 1992.
- Craig RJ. Personality characteristics of heroin addicts: Review of empirical research. *International Journal of the Addictions*. 1982; 17:227–248. [PubMed: 7042600]
- Craig RJ, Weinberg D. Assessing drug abusers with the Millon Clinical Multiaxial Inventory: A review. *Journal of Substance Abuse Treatment*. 1992; 9:249–255. [PubMed: 1460694]
- Darke S, Hall W, Swift W. Prevalence, symptoms and correlates of antisocial personality disorder among methadone maintenance clients. *Drug and Alcohol Dependence*. 1994; 34:253–257. [PubMed: 8033764]
- Eisen SV, Normand SL, Belanger AJ, Spiro A III, Esch D. The revised Behavior and Symptom Identification Scale (BASIS-R): reliability and validity. *Medical Care*. 2004; 42:1230–1241. [PubMed: 15550803]
- Eisen, SV.; Normand, SLT.; Belanger, AJ. BASIS-32® and the Revised Behavior and Symptom Identification Scale (BASIS-R). In: Mahway, MM., editor. *The Use of Psychological Testing for Treatment Planning and Outcome Assessment*. 3rd ed. Vol. 3. New Jersey: Lawrence Erlbaum; 2004. p. 79-115.
- First, MB.; Gibbon, M.; Spitzer, RL.; Williams, JBW.; Benjamin, LS. *Structured Clinical Interview for DSM-IV Axis II Personality Disorders, (SCID-II)*. Washington, DC: American Psychiatric Press, Inc.; 1997.
- Germans S, Van Heck GL, Langbehn DR, Hodiament PPG. The Iowa Personality Disorder Screen: Preliminary results of the validation of a self-administered version in a Dutch population. *European Journal of Psychological Assessment*. 2010; 26:11–18.
- Gerstley L, McLellan AT, Alterman AI, Woody GE, Luborsky L, Prout M. Ability to form an alliance with the therapist: a possible marker of prognosis for patients with antisocial personality disorder. *American Journal of Psychiatry*. 1989; 146:508–512. [PubMed: 2929752]
- Gill K, Nollimal D, Crowley TJ. Antisocial personality disorder, HIV risk behavior and retention in methadone maintenance therapy. *Drug and Alcohol Dependence*. 1992; 30:247–252. [PubMed: 1396106]
- Hesse M, Rasmussen J, Pedersen MK. Standardised assessment of personality--A study of validity and reliability in substance abusers. *BMC Psychiatry*. 2008; 8:7. [PubMed: 18221511]
- Koenigsberg HW, Kaplan RD, Gilmore MM, Cooper AM. The relationship between syndrome and personality disorder in DSM-III: Experience with 2,462 patients. *American Journal of Psychiatry*. 1985; 142:207–212. [PubMed: 3970245]
- Langbehn DR, Pfohl BM, Reynolds S, Clark LA, Battaglia M, Bellodi L, et al. The Iowa Personality Disorder Screen: development and preliminary validation of a brief screening interview. *Journal of Personality Disorders*. 1999; 13:75–89. [PubMed: 10228929]

- Lenzenweger MF, Lane MC, Loranger AW, Kessler RC. DSM-IV personality disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*. 2007; 62:553–564. [PubMed: 17217923]
- Moran P, Leese M, Lee T, Walters P, Thornicroft G, Mann A. Standardised Assessment of Personality - Abbreviated Scale (SARAS): Preliminary validation of a brief screen for personality disorder. *British Journal of Psychiatry*. 2003; 183:228–232. [PubMed: 12948996]
- Morse JQ, Pilkonis PA. Screening for personality disorders. *Journal of Personality Disorders*. 2007; 21:179–198. [PubMed: 17492920]
- Murray H, McHugh RK, Behar E, Pratt E, Otto M. Personality factors associated with methadone maintenance dose. *American Journal of Drug and Alcohol Abuse*. 2008; 34:634–641. [PubMed: 18821457]
- Nace EP, Davis CW. Treatment outcome in substance abusing patients with a personality disorder. *American Journal of Addictions*. 1993; 2:26–33.
- Olsson I, Øystein S, Dahl AA. A cross-sectional testing of the Iowa Personality Disorder Screen in a psychiatric outpatient setting. *BMC Psychiatry*. 2011; 11:105. [PubMed: 21711506]
- Pfohl, B.; Blum, N.; Zimmerman, M. Structured Interview For DSM-IV Personality SIDP-IV. Iowa City: The University of Iowa; 1995.
- Pfohl, B.; Blum, N.; Zimmerman, M. Structured Interview for DSM-IV Personality. Washington, DC: American Psychiatric Press; 1997.
- Pilkonis PA, Kim Y, Proietti JM, Barkham M. Scales for personality disorders developed from the inventory of interpersonal problems. *Journal of Personality Disorders*. 1996; 10:355–369.
- Polatin PB, Kinney RK, Gatchel RJ, Lillo E, Mayer TG. Psychiatric illness and chronic low-back pain. The mind and the spine--which goes first? *Spine*. 1993; 18:66–71. [PubMed: 8434327]
- Rounsaville BJ, Kranzler HR, Ball S, Tennen H, Poling J, Triffleman E. Personality disorders in substance abusers: Relation to substance abuse. *Journal of Nervous and Mental Disease*. 1998; 186:87–95. [PubMed: 9484308]
- Teplin D, O'Connell T, Daiter J, Varenbut M. A psychometric study of the prevalence of DSM-IV personality disorders among office-based methadone maintenance patients. *American Journal of Drug and Alcohol Abuse*. 2004; 30:515–524. [PubMed: 15540490]
- Trull TJ, Amdur MA. Diagnostic efficiency of the Iowa Personality Disorder Screen items in a nonclinical sample. *Journal of Personality Disorders*. 2001; 15:351–357. [PubMed: 11556701]
- Van Horn E, Manley C, Leddy D, Cicchetti D, Tyrer P. Problems in developing an instrument for the rapid assessment of personality status. *European Psychiatry*. 2000; 15:29–33. [PubMed: 11520471]
- Wagner EE, Miller AL, Greene LI, Winiarski MG. Dialectical behavior therapy for substance abusers adapted for persons living with HIV/AIDS with substance use diagnoses and borderline personality disorder. *Cognitive and Behavioral Practice*. 2004; 11:202–212.

Figure 1. IPDS CATPCA Component Loadings

Note: IPDS = Iowa Personality Disorder Screen, CATPCA = Categorical principal component analysis

Table 1**Demographic Information.**

	N = 150
Age, mean (SD)	41.5 (10.2)
Sex, % (N)	
Male	56.7% (85)
Female	43.3% (65)
Race/Ethnicity, % (N)	
Black	28.7% (43)
White	58.0% (87)
Hispanic	11.3% (17)
American Indian or Native Alaskan	2.0% (3)
Marital Status, % (N)	
Never Married	52.7% (79)
Married	7.3% (11)
Divorced	24.0% (36)
Separated	4.7% (7)
Widowed	2.0% (3)
Cohabitant	9.3% (14)
Educational Level, % (N)	
Grades 6–8	6.0% (9)
Some High School (no degree)	26.0% (39)
High School Degree or GED	36.0% (54)
Some College	18.0% (27)
Associate's Degree	4.7% (7)
Bachelor's Degree	1.3% (2)
Some Vocational Training	4.7% (7)
Vocational Training Licensed	3.3% (5)
Employment Status, % (N)	
Full Time (40 hours/week)	8.0% (12)
Part Time (regular hours)	6.0% (9)
Part Time (irregular hours)	2.0% (3)
Retired	2.0% (3)
Disabled	28.7% (43)
Unemployed	43.3% (65)
Student	3.3% (5)
Homemaker	4.0% (6)
Self-Employed	2.7% (4)

Note: Some demographic data has been reported previously.

Table 2

IPDS Descriptive Statistics.

Number	Item	PD	Cluster	Descriptives		Factor 1	Factor 2
				M	SD		
05	Excessive social anxiety	AVD	C	.38	.49	.773	
06	Unwilling to get involved unless certain of being liked	AVD	C	.38	.49	.751	
04	Reluctant to confide in others	PAR	A	.79	.40	.650	
07	Lack of stable self image	BRD	B	.36	.48	.602	.374
01	Marked shifts in mood	BRD	B	.49	.50	.527	
09	Expects to be exploited or harmed by others	PAR	A	.38	.49	.480	.339
03	Actions directed toward immediate satisfaction	HST	B	.31	.46	.730	
08	Prone to overemphasize importance	NAR	B	.43	.50	.682	
11	Insensitive to concerns and needs of others	NAR	B	.31	.47	.680	
10	Bears grudges or is unforgiving of insults	PAR	A	.37	.49	.590	
02	Uncomfortable when not the center of attention	HST	B	.05	.21	.363	
Factor 1: Internalizing-Hypersensitive Tendencies ($\alpha = .75$)							
				.44	.31		
Factor 2: Externalizing-Insensitive Tendencies ($\alpha = .65$)							
				.26	.27		
5-Item Subset (Items 4 – 8) ($\alpha = .71$)							
				.45	.31		
6-Item Subset (Items 1 – 6) ($\alpha = .65$)							
				.39	.26		
7-Item Subset (Items 1, 3 – 8) ($\alpha = .74$)							
				.42	.29		
Total Score ($\alpha = .79$)							
				.36	.25		

Note: IPDS = Iowa Personality Disorder Screen, PD = personality disorder, AVD = avoidant, BRD = borderline, HST = histrionic, NAR = narcissistic, PAR = paranoid. Factor loadings < .30 are not shown. The two items with factor loadings < .40 were excluded from the construction of Factor 2 since they loaded more heavily on Factor 1.

Table 3Correlations among IPDS and BASIS-24 Scores¹.

	Depression	Interpersonal Relations	Self-Harm	Emotional Lability	Psychotic Symptoms	Alcohol/Drug Use	BASIS-24 Total
Factor 1	.57**	.41**	.22*	.53**	.50**	.20*	.62**
Factor 2	.35**	.25**	.19*	.49**	.39**	.35**	.46**
5-Item Subset	.57**	.39**	.18*	.49**	.46**	.22**	.60**
6-Item Subset	.56**	.39**	.19*	.59**	.47**	.20*	.62**
7-Item Subset	.60**	.42**	.22**	.59**	.49**	.23**	.65**
Total Scale	.58**	.45**	.23*	.61**	.52**	.29**	.66**

Note: IPDS = Iowa Personality Disorder Screen, BASIS-24 = Behavior and Symptom Identification Scale.

¹ Partial correlations, controlling for race/ethnicity, are presented.

* $p < .05$,

** $p < .01$.

Table 4

Correlations among IPDS and Pain Measure Scores¹ and MMT Characteristics¹.

	Pain Intensity			Pain Interference			MMT Characteristics		
	Worst	Least	Typical	Life	Work	Relationships	Methadone dose	Months of MMT	Number of MMT episodes
Factor 1	.12	.28**	.26**	.34**	.34**	.42**	.126	.258**	.061
Factor 2	.03	-.05	.02	.06	.12	.22*	-.046	-.066	.087
5-Item Subset	.12	.25**	.24*	.30**	.30**	.42**	.086	.238*	.059
6-Item Subset	.08	.25**	.20*	.25**	.28**	.37**	.100	.139	.032
7-Item Subset	.14	.28**	.24*	.30**	.31**	.42**	.086	.197*	.053
Total Score	.10	.21*	.20*	.27**	.29**	.39**	.063	.143	.087

Note: IPDS = Iowa Personality Disorder Screen, MMT = Methadone Maintenance Treatment.

¹ Partial correlations, controlling for race/ethnicity, are presented.

* $p < .05$,

** $p < .01$.