The Relationship between the Dimensions of the "Measurements in the Addictions for Triage and Evaluation" (MATE) Questionnaire and Personality Disorders

Possible risk profiles

Master thesis in mental health promotion

Master Psychology

November 2012

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Abstract

Objective: The purpose of this study was to develop a model to predict the presence of personality disorder traits in general, as well as per cluster, using the total scores of the MATE.

Methods: The sample consisted of 102 patients registering for treatment at Tactus Addiction Treatment. During the 90-minute intake session, the MATE was administered. The SIDP-IV was administered in the second session. Because of the low prevalence of personality disorders in the sample (23%), a dimensional score was conducted for personality disorder traits in general, cluster A traits, cluster B traits, and cluster C traits. Variables that showed a relationship (p<.05) with the percentage of present personality disorder traits and variables that were in accordance with the hypotheses were included in a multivariate linear regression model. This was done for all four dependent variables separately. Subsequently, variables that did not remain independent predictors of present personality disorder traits were one by one removed.

Results: The optimal predictive model (comprising the MATE total scores), after excluding non-significant predictors, consisted of depression (β=.394, p<.001) and personality (β=.340, p<.001). Overall, 34.8% of the variance of present personality disorder traits was explained by these variables (p<.001). After excluding non-predictive variables in the stepwise multiple linear regression method, the optimal model consisted of psychiatric comorbidity (β=.254, p=.008) and personality (β=.288, p=.003). In total, this model explained 17.2% of the variance in the percentage of present cluster A traits (p<.001) which indicated that the model explains present cluster A traits inadequately. The optimal model of cluster B traits consisted of depression (β=.223, p=.022), anxiety (β=.304, p=.002), and personality (β=.209, p=.023) after the exclusion of all non-predictive variables. The model explained 30.5% of the variance in the percentage of cluster B personality traits. For cluster C traits, the optimal model was composed of depression (β=.358, p<.001) and personality (β=.252, p=.008). Overall, 24.4% of the variance in the present cluster C personality traits was explained by these variables.

Conclusion: This study has shown that the MATE possibly provides more information than was thought. It has been proven that the MATE can disclose risk-profiles which might point to a personality disorder. High scores in depression in combination with high personality scores should thus alarm the professionals to perform additional diagnosis for personality disorders.

Samenvatting

Doel: Het doel van dit onderzoek was het om een model te ontwikkelen wat de aanwezigheid van persoonlijkheidsstoornis kenmerken met hulp van de MATE totaal scores kan voorspellen. Dit geldt voor persoonlijkheidsstoornis kenmerken in totaal, maar ook voor elke cluster.

Methode: Het onderzoek werd afgenomen bij Tactus Verslavingszorg. Bij 102 cliënten die bij Tactus kwamen, werd de MATE tijdens de intake procedure afgenomen. Om persoonlijkheidsstoornis kenmerken te kunnen meten werd gebruik gemaakt van de SIDP-IV in een tweede sessie. De afhankelijke variabelen zijn de dimensionele scores van de SIDP-IV, dus het percentage van de kenmerken die aanwezig zijn – in totaal en per cluster (A, B en C). Hiervoor was gekozen wegens de lage prevalentie van persoonlijkheidsstoornissen in de steekproef (23%). Variabelen die samenhingen ($p<.05$) met de persoonlijkheidsstoornis kenmerken en die in overeenstemming waren met de hypothese, waren opgenomen in een multivariate lineaire regressie analyse.

Resultaten: Het model wat persoonlijkheidsstoornis kenmerken in totaal kon voorspellen bevat de predictoren depressie ($\beta=.394$, $p<.001$) en persoonlijkheid ($\beta=.340$, $p<.001$). Dit model verklaarde 34.8% van de variantie van persoonlijkheidsstoornis kenmerken in totaal. Het model wat cluster A kenmerken kon voorspellen bevat de predictoren psychiatrische comorbiditeit ($\beta=.254$, $p=.008$) en persoonlijkheid ($\beta=.288$, $p=.003$). Dit model verklaarde 17.2% van de variantie van de cluster A kenmerken. Het model wat cluster B kenmerken kon voorspellen bevat de predictoren depressie ($\beta=.223$, $p=.022$), angst ($\beta=.304$, $p=.002$), and persoonlijkheid ($\beta=.209$, $p=.023$). Dit model verklaarde 30.5% van de variantie van de cluster B kenmerken. Het model wat cluster C kenmerken kon voorspellen bevat de predictoren depressie ($\beta=.358$, $p<.001$) and persoonlijkheid ($\beta=.252$, $p=.008$). Dit model verklaarde 24,4% van de variantie van de cluster C kenmerken.

Conclusie: Dit onderzoek heeft aangetoond dat de MATE meer informatie bevat dan werd verwacht. Het is aangetoond dat de MATE verschillende risicoprofielen kan opleveren die een aanwijzing kunnen zijn voor een persoonlijkheidsstoornis. Hoge totaal scores in the MATE modules persoonlijkheid en depressie kunnen een aanwijzing zijn voor een mogelijke comorbide persoonlijkheidsstoornis.

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1 Introduction

1.1 Reform of the substance abuse treatment system

In the past 20 years there have been a lot of developments in the treatment of addictive disorders. The Netherlands are one of the few countries that have successfully passed a complete reorganization of their substance abuse treatment services. In the nineties there has been a lot of criticism on the organization and the effectiveness of this system (Schippers, Schramade, & Walburg, 2002) regarding the effectiveness, transparency and it not being evidence-based enough. The three main goals of the reform were developing evidence-based prevention and treatment interventions, setting up a feedback system to enable outcome measurement, and innovating training and development. These goals were reached after 12 years in 2010, ending the reform (Schippers, Nabitz, & Buisman, 2009). The most widely used and criticized instrument in the measurement of addictions before the reform of the Dutch substance abuse treatment system was the Addiction Severity Index (ASI; Schippers, Broekman, Buchholz, Koeter, & van den Brink, 2009). It was frequently used since 1980 and is available in nine different languages. The purpose of the ASI is to enable the measurement of treatment outcomes (McLellan et al., 1992). It covers seven areas: physical health, employment and financial support, illegal or criminal activity, family and social relationships, psychiatric symptoms, drug use, and alcohol use. Those areas are examined in a semi-structured interview. Research shows that the reliability spanned from excellent to unsatisfactory while its validity was low, pressing Mäkelä (2004) to suggest, not to use it in clinical practice any longer. Another point of criticism on the ASI is the lack of a conceptual and theoretical basis (Broekman, Schippers, Koeter, & van den Brink, 2004).

1.2 A new instrument

Against this background, Schippers and colleagues felt the need for a new and innovative measurement instrument. They observed the importance of getting an overview of the obstacles the target group has to face as an indication for treatment (Schippers, Broekman, Buchholz, & Rutten, 2009). Clients can, for example, vary in amount and type of substance use, personality, comorbidities (physical and psychiatric), prior treatment experiences, social and financial situation and so forth. The new instrument, named 'Measurements in the Addictions for Triage and Evaluation' (MATE) is supposed to reach certain objectives, which could only be partly achieved (Schippers, Broekman, Buchholz, & Rutten 2009). The

developers wanted to avoid creating new instruments, since acceptable already existing instruments were available. They make up approximately half of the MATEs content. Schippers and colleagues wanted the measurement itself to be less extensive and burdensome for the personnel. The structure should be kept flexible, so that the different parts of the instruments can be adapted as needed. Schippers et al. (2009a) study shows that the personnel enjoys working with the MATE as it is easy apply and to adapt to specific situations (for example using only some parts of the MATE). Furthermore, the developers wanted to be able to relate the data about substance use gained by this instrument to other mental health domains.

The instrument is based on the biopsychosocial model of health, the perspective of the World Health Organization (Schippers, Broekman, Buchholz, & Rutten 2009b). This model is adapted in the International Classification of Functioning, Disability, and Health (WHO, 2001). The biopsychosocial model of health assumes that biological, social, and psychological factors, as thoughts, emotions, and behaviors, play important roles in illness and disease. The Measurements in the Addictions for Triage and Evaluation (MATE) were developed from 2003 to 2007 (Buchholz, Broekman, & Schippers, 2010). Recently, six out of ten large Dutch regional addiction service organizations have adopted the MATE in their triage process, which shows the acceptance of the new instrument. However, this isn't an indicator that it is more effective than previous instruments.

Not much research has been conducted regarding the reliability and validity of the MATE as a whole instrument. The main developer of the MATE, G. M. Schippers and colleagues performed a few studies, in which reliability, validity, and feasibility for only one module of the MATE, the MATE-ICN, were tested. The MATE-ICN consists of the ICF core set (WHO, 2001). It includes information about participation and activities, care and support, and the need for help. It also provides data about positive and negative external influences on rehabilitation.

In 2007, Schippers and Broekman conducted two reliability studies for the MATE-ICN. The first study took place under controlled conditions at GGD Amsterdam which proved the interrater-reliability to be good to excellent (ICC 0.78-0.92). The second study was conducted under real life conditions at Tactus showing lower interrater-reliabilities (ICC .34 - .73). Especially the domains 'care and support' and 'external influences' seem to be low in reliability (ICC .34 and .38).

The intercorrelations among the different MATE scores appear to be moderate (Schippers & Broekman, 2007). Validation with the World Health Organization Quality of Life Scale – short version (WHOQOL-BREF, WHO, 1993) was reasonably moderate to high, with correlations between -.43 and -.71 (except for two domains: 'getting around' and 'work or school'). Cross-validation with the World Health Organization Disability Assessment Schedule II (WHODAS I, WHO), which uses the factors also found in the MATE-ICN shows moderate results (with correlations around .55).

Buchholz, Rist, Küfner, and Kraus (2009) tested the German version of the MATE. Basically, the results are comparable to those in previous studies. It is found that the interrater-reliability is acceptable only for the standardized modules. Training the staff appears to be helpful to improve results. The concurrent validity is shown to be satisfactorily, the feasibility seems to be highly satisfactorily.

Approximately half of the MATE consists of already existing instruments. They measure comorbidities (physical, as well as psychiatric), personality, craving, depression, anxiety, stress, amount of substance use, type of substance used, dependence, and abuse. The questionnaire used in the MATE to screen for a personality disorder is the Standardized Assessment of Personality – Abbreviated Scale [SAPAS], an 8-item self-report questionnaire, with a strong sensitivity and specifity (Moran et al., 2003). Several studies show that it reliably discovers a potential personality disorder in general (Pluck, Sirdifield, Brooker, Moran, 2011; Hesse, Rasmussen, Pedersen, 2008). However, the SAPAS cannot detect specific personality disorders or even a cluster (Hesse, Moran, 2010). Because the SAPAS only shows a potential personality disorder but doesn't go into it far enough to specify it many researchers question its usability.

1.3 Personality disorders and addiction

Although it is not the goal of the SAPAS to detect specific personality disorders or clusters, it would be important in substance abuse treatment. It is found that patients with an untreated personality disorder are less likely to respond to any other treatment (Griggs & Tyrer, 1981; Nace & Davis, 1993). Ball (1998) assumes that this is due to the interpersonal difficulties between patient and therapist, resulting from the maladaptive coping styles. According to Ball, this often leads to dropout and poorer treatment outcomes. If a personality disorder is present, this can even result in a completely different focus of treatment, namely the

maladaptive coping styles, inadequate self-images, and other difficulties arising from the personality disorder.

Accordingly, the personality-domain of the MATE would be of special interest for substance abuse treatment services, because substance dependences, especially alcohol use disorders, are found to be highly comorbid with personality disorders (Sher & Trull, 2002; Trull, Sher, Minks-Brown, Durbin, & Burr, 2000).

The high rates of alcohol use disorders among individuals with antisocial and borderline personality disorders seem to be very robust (Sher et al., 1999). In the study of Zikos, Gill, and Charney (2010) 59% of their help-seeking alcohol dependent outpatients have a personality disorder. This emphasizes the importance of screening for personality disorders in clinical settings that aim to treat substance use disorders. It seems that especially cluster B personality disorders (borderline, histrionic, narcisstic, and antisocial) are associated with abuse or dependence of psychoactive substances. It was found that axis I disorders are correlated with axis II problems. For example, obsessive-compulsive personality disorder is associated with certain anxiety disorders, as generalized anxiety disorder (GAD) and agoraphobia. Avoidant personality disorder is associated with social phobia, obsessive-compulsive disorders, and panic disorder. Borderline personality disorder has been linked to GAD, panic disorder, and obsessive-compulsive disorders. Schizotypical personality disorder seems to increase social phobia and the chronicity of GAD (Ansell, Pinto, Edelen, Markowitz, Sanislow, et al., 2010). Mood-disorders are likely to co-occur with avoidant and dependent personality disorder (Oldham, Skodol, Kellman, 1995). Psychotic disorders might correlate with cluster A personality disorders (Siever, Davis, 1991). Major depression correlated with paranoid, borderline, avoidant, and obsessive compulsive personality disorder. Bipolar disorder is linked to dependent and avoidant personality disorder (Verheul, Kranzler, Poling, Tennen, Ball, Rounsaville, 2000).

The kind of substance that was used also seemed to be related to certain personality disorders. Hard drugs (such as heroine, crack, or cocaine) are more likely to be consumed by individuals with antisocial and borderline personality disorder, most likely because of the impaired impulse and affective dysregulation, which both personality disorders account for (Sher, Trull, 2002).

The MATE provides information about axis I problems, even though not about each one, as well as substance use and other factors that are related to personality disorders. The

axis I problems which can be found in the MATE are the presence of depression, anxiety, and stress, suicidal risk, and psychotic symptoms as hallucinations or delusions. There can be no talk of axis I diagnoses. Nevertheless it might be possible to gain supplemental information such as indicators for a personality disorder.

The purpose of this study is to develop a model to predict the presence of personality disorder traits, in general as well as for each cluster (A, B, and C). Thus it is examined if the connections found in earlier studies are also translatable to the MATE dimensions, i.e. the total scores. This study is supposed to verify if the MATE dimensions can be used to develop risk profiles which point to a present personality disorder, with the goal being to discover predictors for a personality disorder aiding the professional to decide whether or not further personality testing is necessary.

2   Methods

The study was commissioned by Tactus Addiction Treatment. Tactus is a facility in the Netherlands for prevention and treatment of alcohol, drugs or medicine disorders, and since recently, of pathological gambling and gaming. It provides outpatient, part-time and clinical help and support for clients seeking help by choice or for clients, who came into contact with law because of their substance abuse problems. The services of Tactus Addiction Treatment are also designed for relatives of those affected by addiction problems. The study was approved by the Medical Ethical Committee, NL20385.097.07 / 20385.

2.1 Participants

The sample consisted of 102 patients registering for treatment from Tactus (locations Enschede, Deventer, and Apeldoorn) and went through the MATE procedure in the intake procedure. The MATE is usually obligatory in the intake procedure of Tactus. Participants were included only if they were minimal 18 years old and if they had good knowledge and understanding of the Dutch language, so that the questionnaires and interviews would provide reliable information.

The only exclusion criterion was an acute intoxication. The well-trained and experienced intake personnel of Tactus estimated if a possible intoxication was too acute to go further with the procedure. In this case, a new appointment was made for approximately one week later.

All participants received an informed consent in the first intake session. After successful participation, all patients received an amount of 25€ in the form of gift coupons.

2.2 Instruments

The following instruments were used in this study:

2.2.1 Measurements in the Addictions for Triage and Evaluation (MATE)

Table 1 summarizes the structure of the MATE. The MATE consists of five domains. 'Substance-related disorders' contains the use of substances, dependence and abuse, and craving. Those concepts are measured with a use-grid, which has been developed to measure the use of the past 30 days, the Composite International Diagnostic Interview (CIDI; WHO, 1997), and the Obsessive-Compulsive Drinking (and drug use) Scale (OCDS; Anton, Moak,

& Latham, 1996). The second domain 'psychiatric comorbidity' is composed of the Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995), the Standardised Assessment of Personality – Abbreviated Scale (SAPAS; Moran et al., 2003), and a newly developed interview by Schippers and colleagues, that schedules psychotic symptoms, suicidality and current psychiatric treatment of the patient. The domain of physical comorbidity consists of the Maudsley Addiction Profile – Health Symptoms Scale (MAP-HSS; Marsden et al., 1998) and an interview that briefly screens the health condition and diseases. The two last domains ('Personal and social functioning' and 'treatment history') are also examined through specially developed interviews.

The ten modules of the Dutch version of the Measures in the Addictions for Triage and Evalutation are as follows:

Module 1 traces substance use and comprises 15 open question items about the use of psychoactive substances and gambling in the last 30 days and lifetime (in the particular units, such as mg, glasses, etc.). In the MATE, this is called a 'use-grid'. This use-grid is the developed by Schippers et al. (2009).

Module 2 (which addresses dependence and abuse) includes the 11-item Composite International Diagnostic Interview (CIDI, WHO, 1997), which verifies the ICD/DSM-criteria for substance abuse and substance dependence. The reliability (weighted kappa ranging from .6 to .8) and internal consistency (Cronbach's alpha .89) of the CIDI questionnaire was found to be satisfactorily and was adjusted that it can be efficient in both, research and clinical practice (Gigantesco & Morosini, 2008).

Craving is investigated via the 5-item module 3 with the Obessive Compulsive Drinking Scale (OCDS, Anton, Moak, & Latham, 1996). For each of the five items, the patient can choose between five possible answers. The OCDS is a 14-item self-report questionnaire that is supposed to measure alcohol- (and drug-) associated thoughts and compulsions to drink, which is also called 'craving' (de Wildt et al., 2005). It is shown to be construct valid in a heavy drinking population (Connor, Jack, Feeney, & Young, 2008) and, using a four-factor model (variance explained: 71.9%), valid in a young adult population (Connor, Feeney, Jack, & Young, 2010). However, de Wildt et al. (2005) found, that it does not meet the requirements of the goodness of fit model, which means that there are still discrepancies between observed values and values expected under this model.

The forth module is conducted of the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995). Here, 21 items are scored with a 4-point Likert-scale. The Depression Anxiety and Stress Scales consist of three scales with 7 items each. With nonclinical samples, the internal consistency, reliability and validity were found to be strong (Lovibond & Lovibond, 1995). Furthermore, the factor structure is confirmed. Brown, Chorpita, Korotitsch, and Barlow (1997) showed strong support for the internal consistency of the three scales in a clinical group (Cronbach's alpha of .96, .83 and .93 for depression, anxiety, and stress, respectively). Here, too, the factor structure is very stable, explaining 55% of the variance. Also, a strong support for the underlying model of negative emotionality is recently found in the short version of the DASS in a sample of adolescents (Willemsen, Markey, Declercq, & Vanheule, 2011).

The fifth module considers the indicators for psychiatric or medical consultation. For example, whether the patient is prescribed any medication, an assessment of the suicide risk, potential pregnancy, or psychotic symptoms. The questions are open questions and yes/no-questions.

The personality module (module six) is conducted of the Standardized Assessment of Personality Abbreviated Scale (Moran et al., 2003) and contains the first eight yes/no-questions of the Standardized Assessment of Personality.

Physical complaints are inquired in module seven with the help of the MAP-HSS (Marsden et al., 1998). This scale consists of ten items (such as 'chest pain', 'muscle pains', or 'numbness'). The items are scored with a 5-point Likert-scale.

Module eight is composed of an open Interview about the current health conditions of the client.

Module nine enquires care and support and environmental factors influencing recovery (this part is named the 'MATE-ICN'). Here, for 27 items (such as "Did you have difficulties with your family or friends?", or "Are there people in your environment who are supportive and who are having a positive influence on you and your recovery?"), the extent of limitation, the received care and support, and the need for care is scored through 4-point scales or yes/no-answers.

With module ten, in a short interview the staff can get an overview over the history of prior treatment for substance use disorders.

The independent variables in this study were the total scores of the ten MATE modules, which can also be viewed in Table 1.

For measuring type and amount of substance use, it was decided that one variable from the use-grid will be sufficient, because they all correlated highly with one another. So, for substance use and type the independent variable was 'type and amount of substance use', which is the average number of years that a certain substance is used.

Table 1 – The structure of the MATE

Domain	Concept	Module	Dimesion (Total score, possible range)
Substance-related disorders	Use	**1 - Use grid**	'*substance use*' (number of years the substance is used)
	Dependence and Abuse	**2 - CIDI** (ICD/DSM criteria)	'*dependence*' (0-7) '*abuse*' (0-4) '*severity of abuse/dependence*'(0-9)
	Craving	**3 -** Obessive-Compulsive Drinking Scale (**OCDS**)	'*craving*' (0-40)
Psychiatric comorbidity	Anxiety , depression and stress	**4 -** Depression Anxiety Stress Scales (**DASS**)	'*depression*' (0-42) '*anxiety*' (0-42) '*stress*' (0-42) '*DASS-total*' (0-126)
	Psychotic symptoms, suicidality Current pyschological or psychiatric treatment	**5 -** MATE-**Interview** Module	'*psychotic symptoms, suicidality*' (0-5) '*undergoing treatment*' (0-2)
	Personality disorders	**6 -** Standardised Assessment of Personality Abbreviated Scale (**SAPAS**)	'MATE *personality*' (0-8)
Physical comorbidities	Physical complains	**7 -** Maudsley Addiction Profile-Health Symptoms Scale (**MAP-HSS**)	'*physical complains*' (0-40)
	Health condiction, diseases	**8 -** MATE-**Interview** Module	'*comorbid physical diseases*' (0-4)
Personal and social functioning	Activities, participation Care and support Need for care Environmental factors	**9 - MATE-ICN**: ICF core set and need for care	'*limitations-total*' (0-76) '*limitations – basic*' (0-32) '*limitations – relationships*' (0-20) '*care and support*' (0-20) '*positive external influences*' (0-12) '*negative external influences*' (0-20) '*need for care*' (0-20)

Treatment history	Number of treatments that focused on addictive behavior	**10 -** MATE-**Interview** Module (Schippers et al., 2009)

2.2.2 Structured Interview for DSM-IV Personality Disorders (SIDP-IV)

The Structured Interview for DSM-IV Personality Disorders is used as the gold standard in the clinical diagnostics of personality disorders. It is a semi-structured interview, which detects personality disorders as defined in the DSM-IV. Additionally, it takes the four non-specified personality disorders into account, which can be found in de appendix B of the DSM-IV (depressive, passive-aggressive, sadistic, and self-defeating personality order). The SIDP-IV thus consists of ten domains.

For the researcher the use of this instrument takes 2 – 3 hours (taking the interview and scoring it), depending on the complexity of the problem. For each item, there are four possible scores: 0 = 'not present', 1 = 'almost present', 2 = 'present' and 3 = 'strongly present'. The interview itself takes about 45 – 90 minutes. All questions are positively formulated, so that the interview is non-threatening for the patient. The SIDP-IV has been translated into Dutch by four different translators .

The classical method of scoring is a categorical score, meaning that the diagnosis of a personality disorder depends on a cut-off score. This cut-off is defined by the DSM-IV criteria and thus different for each personality disorder. However, it is also possible to create a dimensional score, so that the staff can focus on patient characteristics instead of on categories (Damen, 2005). According to Jane, Pagan, Turkheimer, Fiedler, and Oltmanns (2006), reliability even increased when the dimensional rather than the categorical scale is used. They also found an overall good reliability, except for the observational criteria. This finding has been validated in different samples (Zimmerman, 1994). Because of the low prevalence of personality disorders in this sample, we decided to use the dimensional score of the SIDP-IV. For this study four dimensional SIDP-IV scores were created: the percentage of present personality disorder traits in general, i.e. all possible traits, the percentage of present cluster A traits, the percentage of present cluster B traits, and the percentage of present cluster C traits. Those four dimensional SIDP-IV scores served as dependent variables in the current study.

2.3 Design and procedure

In the very first contact with Tactus Addiction Treatment, when registering, participants made appointments for the intake procedure. Before the intake session, they received a letter with information about the research project and the informed consent. When they came for the intake session, the clients were asked if they are interested in participating. Then, in this session, the MATE was administered. This first session took 90 minutes. After a successful participation in the first session, the participants got a second appointment. In the second 90 minute session, the SIDP-IV was administered. At the end of the second contact, they received a 25€ coupon, if completed successfully.

2.4 Data analysis

A linear regression analyses was used to determine the predictors of the presence of personality disorder traits and the presence of cluster A, B, and C traits. The following variables were entered in the analysis as possible predictors of high dimensional SIDP-IV scores: the number of years certain substances (alcohol, nicotine, cannabis, methadone, heroine, opiates, crack, cocaine, stimulants, ecstasy, stimulants, sedatives or others) were used at the point of the measurement, dependence, abuse, severity of abuse/dependence, craving, depression, anxiety, stress, DASS-total, psychiatric comorbidity, undergoing treatment, personality, physical complains, physical comorbidity, limitations-total, limitations-basic, limitations-relationships, positive external influences, negative external influences, need for care.

First, all these possible determinants were univariately assessed on their relationship with the percentage of present personality disorder traits, with correlation analyses and with individual linear regression analysis to predict the variations of the present personality disorder traits explained by each possible predictor. Only variables that showed a relationship (p<.05) with the percentage of present personality disorder traits and that were in accordance with our hypotheses about the possible model were included in a multivariate linear regression model. This was done for all four dependent variables separately. Subsequently, variables that did not remain independent predictors of present personality disorder traits were one by one removed until explained variance decreases more than 10%.

3 Results

From the 102 participants, 82 (80.4%) were male and 20 (19.6%) were female. The mean age was 40.65 (SD=10.79), with the youngest participant being 23 and the oldest being 64 years old. Table 2 shows the baseline characteristics of the sample.

Personality disorders diagnosed by the SIDP-IV were rarely found (23% in the whole sample). We therefore decided to use the percentages of present personality disorder traits in total and the percentages of present cluster A, B and C traits.

Table 2 – Baseline characteristics of the current sample (N=102)

Variable	Mean (S.D.)	N
Age	40.7 (10.8)	102
Use in years:		
Alcohol	13.8 (11.3)	92
Nicotine	20.8 (9.9)	89
Cannabis	8.0 (7.8)	47
Methadone	3.0 (5.9)	11
Heroine	4.0 (7.8)	11
Opiate	0.1 (0.3)	8
Crack	3.6 (5.4)	21
Cocaine	3.8 (4.4)	27
Stimulants	2.2 (2.6)	17
Ecstasy	2.8 (4.1)	17
Sedatives	6.4 (8.8)	18
Others	0.4 (0.9)	11
Gambling	6.5 (9.0)	20
Primary problem substance:		
Alcohol	54.9%	
PD traits (%)	9.9 (5.7)	
Cluster A traits (%)	7.8 (7.5)	
Cluster B traits (%)	8.1 (6.4)	
Cluster C traits (%)	12.5(8.4)	
MATE dimensions:		
Dependence (0-7)	4.6 (1.7)	
Abuse (0-4)	2.1 (1.1)	
Severity of abuse/dependence (0-9)	5.9 (2.2)	
Craving (0-40)	7.7 (4.6)	
Depression (0-42)	12.5 (9.6)	
Anxiety (0-42)	7.4 (6.8)	
Stress (0-42)	14.1 (9.3)	
DASS-total (0-126)	34.0 (21.3)	
Psychotic symptoms, suicidal risk (0-5)	0.3 (0.7)	
Undergoing treatment (0-2)	0.6 (0.8)	
MATE personality (0-8)	3.4 (1.6)	

Physical complains (0-40)	10.0 (6.2)
Comorbid physical disease	0.3 (0.6)
Limitations-total (0-76)	13.3 (7.3)
Limitations-basic (0-32)	3.3 (3.1)
Limitations-relationships(0-20)	4.2 (3.0)
Care and support (0-20)	3.2 (3.2)
Positive external influences (0-12)	3.5 (2.1)
Negative external influences (0-20)	3.7 (3.0)
Need for care (0-20)	4.7 (3.3)

3.1 The relationship between the MATE dimensions and personality disorders

Table 3 (Appendix A) shows that not all of the MATE dimensions were correlated with personality disorder traits in general. A high score in the SAPAS (module six of the MATE) is correlated with the presence of personality disorder traits (r=0.45, p<.001). The higher the amount of craving, the higher the presence of personality disorder traits (r=0.23, p=.019). High scores in the DASS in total (r=0.52, p<.001), and in the subtests for depression, anxiety, and stress (r=0.49, r=0.41, r=0.38, with p<.001 respectively) were significantly related to a higher percentage of personality disorder traits. Further explorative analyses showed that several other scores out of the MATE correlate with personality disorders. Those total scores were psychiatric or psychological treatment, physical comorbidity, addiction, severity of abuse/addiction, physical complains, limitations – total, limitations – basic, limitations – relationships, care and support, negative external influence, and need for care.

The analyses have shown that two out of the nine substances correlated with the personality disorder traits. The total number of years of nicotine regular use (p=.010) was related to personality disorder traits: the higher this score, the higher the percentage of present personality traits. The same was true for crack use. The higher the total number of years the crack was consumed (p=.034), the higher the number of present personality disorder traits.

3.2 Which MATE total scores predict high dimensional scores on the SIDP-IV?

Linear regression analyses showed that the total score of the DASS was the strongest predictor of high scores in SIDP-IV. It explains 27.2% (F= 36.572, p<.001) of the variance. High scores on the depression dimension of the DASS explained 24.2% (F=31.289, p<.001) of the variance of the scores in the SIDP-IV. The number of years crack was used regularly

explained 22.8% (F=5.617, p=.029) of the variance of the dependent variable. High scores in the personality module in the MATE (which is the SAPAS) predicted 20.6% (F=25.412. p<.001) of the percentages of present personality disorder traits in total. The two other dimensions of the DASS, anxiety and stress, accounted for 17.5% (F=20.820, p<.001) and 14.3% (F=16.345, p<.001) of the variance. The number of years nicotine was used explained 7.8% (F=7.242, p=.009). The predictive value of the factor craving 5.3% (F=5.505, p=.021).

Explorative linear regression analyses were executed, too; for the MATE total scores that were found to correlate with high SIDP-IV dimensional scores in this study but not in previous research. The variances within the SIDP-IV scores explained by those variables lay between 3.9% and 13.5%. Table 4 summarizes the linear regression analyses of the MATE total scores predicting the percentage of present personality disorder traits.

Table 4 – Predictive values of the individual MATE total scores

MATE dimension	β	p	R²
DASS-total	.521	<.001	.272
Depression	.492	<.001	.242
Crack use	.478	.029	.228
MATE personality	.454	<.001	.206
Anxiety	.419	<.001	.175
Stress	.378	<.001	.143
Nicotine use	.279	.009	.078
Craving	.231	.021	.053
Limitations-total	.367	<.001	.135
Physical complains	.361	<.001	.131
Limitations-basic	.339	.001	.115
Negative external influences	.324	.001	.105
Undergoing treatment	.246	.001	.061
Care and support	.243	.015	.059
Need for care	.217	.030	.047
Severity dependence/abuse	.216	.031	.047
Limitations-relationships	.211	.035	.045
Addiction	.207	.039	.043
Psychotic symptoms, suicidal risk	.197	.050	.039

3.3 Risk profiles in the MATE as possible hints for personality disorders

Depression, anxiety, stress, craving, personality, limitations-total, undergoing treatment, and psychiatric comorbidity were found to be possible predictors of a high dimensional SIPD-IV score. Table 5 presents the beta values for all variables included in the model of present personality disorder traits.

The optimal predictive model, after excluding non-significant predictors, consisted of depression (β=.394, p<.001) and personality (β=.340, p<.001). Overall, 34.8% of the variance of present personality disorder traits was explained by these variables (p<.001).

Table 5 – Predictive values of the variables included in the multivariate model of personality disorder traits

	Multivariate starting model of personality disorder traits (Nagelkerke R²=.387)			
	p-value	beta	B	95% CI for B
Depression	.008	.305	.181	0.049 - 0.314
Anxiety	.071	.198	.164	-0.014 – 0.341
Stress	.714	-.042	-.026	-0.164 – 0.112
Craving	.954	.005	.007	-0.219 – 0232
MATE personality	.002	.293	.1032	0.382 – 1.682
Undergoing treatment	.723	.033	.251	-1.153 – 1.655
Limitations-total	.380	.085	.067	-0.083 – 0.217
Psychotic symptoms, suicidal risk	.853	-.017	-.144	-1.682 – 1.395
Note – 95%CI = 95% confidence interval				

The same model was tested for cluster A personality disorder traits. Table 6 presents the beta values of all variables included in the multivariate model of cluster A traits. After excluding non-predictive variables in the stepwise multiple linear regression method, the optimal model consisted of psychiatric comorbidity (β=.254, p=.008) and personality (β=.288, p=.003). In total, this model explained 17.2% of the variance in the percentage of present cluster A traits (p<.001) which indicated that the model explains present cluster A traits inadequately.

Table 6 – Predictive values of the variables included in the multivariate model of cluster A traits

	Multivariate starting model of cluster A traits (Nagelkerke R²=.197)			
	p-value	beta	B	95% CI for B
Depression	.425	.103	.080	-0.119 – 0.280
Anxiety	.610	-.063	-.069	-0.337 – 0.199
Stress	.352	-.121	-.098	-0.306 – 0.110
Craving	.825	.023	.038	-0.302 – 0.377
MATE personality	.013	.269	1.252	0.271 – 2.232
Undergoing treatment	.662	.047	.468	-1.650 – 2.586
Limitations-total	.378	.098	.101	-0.125 – 0.327
Psychotic symptoms, suicidal risk	.017	.262	2.852	0.532 – 5.172
Note – 95%CI = 95% confidence interval				

Depression, anxiety, stress, craving, personality, limitations-relationships, treatment, and psychiatric comorbidity were found to be possible predictors of both, the presence of cluster B and the presence of cluster C traits. Table 7 and table 8 present the beta values of all variables included in the multivariate models for cluster B traits and for cluster C traits, respectively. The optimal model of cluster B traits consisted of depression (β=.223, p=.022), anxiety (β=.304, p=.002), and personality (β=.209, p=.023) after the exclusion of all non-predictive variables. The model explained 30.5% of the variance in the percentage of cluster B personality traits. For cluster C traits, the optimal model was composed of depression (β=.358, p<.001) and personality (β=.252, p=.008). Overall, 24.4% of the variance in the present cluster C personality traits was explained by these variables.

Table 7 – Predictive values of the variables included in the multivariate model of cluster B traits

	Multivariate starting model of cluster B traits (Nagelkerke R^2=.377)			
	p-value	beta	B	95% CI for B
Depression	.034	.235	.155	0.012 – 0.299
Anxiety	.001	.391	.359	0.161 – 0.558
Stress	.340	.110	.075	-0.080 – 0.230
Craving	.122	-.143	-.196	-0.446 – 0.053
MATE personality	.004	.277	1.087	0.355 – 1.818
Undergoing treatment	.033	-.202	-1.711	-3.284 - -0.137
Limitations-relationships	.269	-.103	-.216	-0.602 – 0.170
Psychotic symptoms, suicidal risk	.468	-.069	-.636	-2.371 – 1.098
Note – 95%CI = 95% confidence interval				

Table 8 – Predictive values of the variables included in the multivariate model of cluster C traits

	Multivariate starting model of cluster C traits (Nagelkerke R^2=.287)			
	p-value	beta	B	95% CI for B
Depression	.006	.331	.291	0.087 – 0.496
Anxiety	.224	.143	.175	-0.109 – 0.458
Stress	.673	-.052	-.047	-0.268 – 0.174
Craving	.427	.078	.143	-0.213 – 0.499
MATE personality	.043	.206	1.076	0.033 – 2.119
Undergoing treatment	.178	.136	1.532	-0.711 – 3.775
Limitations-relationships	.742	-.033	-.091	-0.642 – 0.459
Psychotic symptoms, suicidal risk	.315	-.103	-1.257	-3.729 – 1.215
Note – 95%CI = 95% confidence interval				

4 Discussion

The aim of this study was to develop models to predict the present of personality disorder traits in total and for the three clusters with the MATE total scores. Surprisingly, relatively few personality disorders diagnosed with the help of the SIDP-IV were present in the sample, so that we created dimensional SIDP-IV scores. All optimal models contain the MATE personality score as a predictor. Other predictors were depression, anxiety, and psychiatric comorbidity. However, the latter wasn't a good predictor. The relationships between certain factors, such as axis I problems, craving, and the SAPAS score, with personality disorder traits could be partly confirmed. Most of the remaining MATE total scores could also be related to personality disorder traits.

Four models to predict personality disorder traits in general, and cluster A, B and C traits were found, wovon das Model für Cluster A eher schwach ist. Personality disorders in general and cluster C traits can be predicted through a high MATE personality score (i.e. the SAPAS score), in combination with high depression scores in the DASS. This is in line with previous findings. The DASS scores belong to the domain 'psychiatric comorbiditiy' in the MATE. Axis I disorders are highly correlated with axis II disorders (Ansell et al., 2010; Oldham, Skodol, Kellman, 1995; Siever, Davis, 1991). But instead of giving information about axis I disorders the MATE only shows axis I problems such as depression, anxiety, stress, and psychotic symptoms and suicidal risk. Of all of these, the only good predictor for a potential personality disorder in general as well as per cluster is the factor depression. Surprisingly, anxiety had no bigger influence in three of the four models even though certain personality disorders, like obsessive compulsive personality disorder and avoidant disorders are likely to occur together with anxiety disorders. One possible explanation for this might be that general anxiety as measured in the MATE using the DASS is hard to compare to the anxiety resulting from actual anxiety disorders. This would mean that previous findings concerning the correlation between axis I and axis II disorders cannot be translated to the MATE, because the part of the MATE that deals with the axis I problems isn't detailed enough for that purpose. To evaluate this properly and to compare axis I disorders to the axis I problems part of the MATE conclusively future research is needed.

The MATE personality score can be found in each of the four models. This proves again that the SAPAS has earned its place in the MATE because it discovers personality disorder traits reliably.

It was presumed that the amount and type of substance use is related with personality disorders, insofar as hard drugs are more likely to be consumed by people with especially cluster B personalities. This assumption could not be fully confirmed in this study. The only hard drug that could be related to personality disorder traits was crack. A possible explanation for this finding might be that very few hard drug users participated in this study, so that possible relationships between the other hard drugs (such as cocaine, heroin, or opiates) and personality disorder traits stay undiscovered. It is also possible that these connections couldn't be found because of the low prevalence of personality disorders, especially of Cluster B personality disorders which were found to be most likely related with hard drug use (Sher & Trull, 2002). Even the prevalence of personality disorder traits was very low. Further research is needed because of the possibility that this hypothesis only fits for individuals with severe cases of personality disorders.

In addition to that the low prevalence of diagnosed personality disorders (23% diagnosed personality disorders) and the present personality disorder traits itself were also very surprising. Practice tells us that often around 40% of clients with an addiction problem also have a comorbid personality disorder. In the study of Zikos, Gill, and Charney (2010) for instance, 59% of their outpatient sample had a personality disorder. In the study of Verheul et al. (2000) the sample was similar to the current sample. There, the sample consisted of individuals entering substance abuse treatment. The prevalence of personality disorders was 57%. Explaining the very low prevalence of personality disorders or even personality disorder traits is difficult. Ball (1998) found that personality disorders might lead to more frequent dropout. This might be due to difficulties in relationships, maladaptive coping styles or high levels of suffering. Two sessions of 90 minutes each might be too straining for clients with personality disorders, so that they are not represented in this study. However, other studies with higher percentages of present personality disorders, such as these of Zikos, Gill, and Charney (2010) or Verheul et al. (2000) had to deal with the same problems.

Another surprising finding was that alcohol use could not be related to personality disorder traits; although it is found that especially alcohol use disorders are highly comorbid with personality disorders (Sher & Trull, 2002; Trull et al., 2000). In previous studies (Sher & Trull, 2002; Trull et al., 2000; and Sher et al., 1999) alcohol dependence has been linked to personality disorders. Counter-intuitively, this relationship was not found in the current study, although alcohol was the main problem substance in this sample. It might be that he clients in this study registered themselves relatively voluntarily at Tactus for an addiction treatment. It

is possible that clients with a milder form of addiction problems are more willingly to go to therapy, and especially to participate in a study, than those with severe alcoholism. It would have been helpful if the motives for dropouts were clear, to test this hypothesis. Another possible reason is the low prevalence of personality disorder traits.

4.1 Shortcomings and limitations

This study has several shortcomings that made the interpretations of the results not that apparent.

First, our sample included very few hard drug users, so that the internal consistency of the results concerning drug use is rather low. In future research it may be advisable to balance the total number of hard drug users with the number of soft drug users. Secondly, the mean age is 40 and very young or older individuals are not taken into account. This means that the results are not representative for younger or older populations. Thirdly, there are very few personality disorder diagnoses included in the sample, so that here, too, internal consistency is low for the outcomes. In future research there should be more individuals with personality disorders included to make results stronger. All data of individuals who didn't want to partake in the study or dropped out of it should be kept. With this a validation of the sample might be possible and facilitate interpretation.

4.2 Implications for practice

There is still little research done about the MATE as a whole. This study has shown that the MATE possibly provides more information than was thought: It has been proven that the MATE can disclose risk-profiles which might point to a personality disorder. High scores in psychiatric comorbidity in combination with high SAPAS scores should thus alarm the researcher and potentially make him test for personality disorders. This study implies a starting point for further research about the different MATE scores in relation with personality disorders, so that future intake can be designed more efficiently and treatment can become more suitable. For instance it would be possible to develop specific instruments for those personality disorders based on those risk-profiles. The SAPAS might be helpful discovering personality disorders but to use the MATE more efficiently in the future it is necessary to look at the other correlations.

4.3 Conclusion

The personality module of the MATE (i.e. the SAPAS) is not the only predictor of a possible personality disorder. As an implication for practice, the intake team should pay attention for the four different risk factors that were found in this study: If high depression scores co-occur with high MATE personality scores, the intake team should think of a possible personality disorder in general and a cluster C personality disorder. If anxiety, depression, and the MATE personality are high, a cluster B personality disorder is likely. High depression scores, high MATE personality scores and high scores on psychotic symptoms and suicidal risk might point to a cluster A personality disorder.

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6 Appendix A

Table 3 – **Correlation matrix of the MATE total scores and personality disorder (PD) traits**

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. PD traits																				
2. dependence	,207																			
3. abuse	,193	,430**																		
4. severity dependence	,216*	,892**	,736**																	
5. craving	,231*	,400**	,062	,298**																
6. depression	,492**	,264**	,092	,206*	,278**															
7. anxiety	,419**	,367**	,102	,307**	,382**	,427**														
8. stress	,378**	,321**	,146	,278**	,199*	,600**	,519**													
9. DASS-total	,521**	,375**	,137	,310**	,333**	,848**	,740**	,873**												
10. psychiatric comorbidity	,197*	,205*	,092	,170	,067	,244*	,378**	,275**	,350**											
11. undergoing treatment	,246*	,070	-,020	,033	,066	,197*	,279**	,261**	,291**	,348**										
12. personality	,454**	,160	,118	,146	,167	,287**	,275**	,353**	,370**	,136	,334**									
13. physical complains	,361**	,328**	,244*	,341**	,350**	,304**	,495**	,299**	,425**	,180	,239*	,191								
14. phsycial comorbidity	,007	,119	-,082	,045	-,029	,089	,118	,003	,079	,139	,236*	-,057	,323**							
15. limitations -total	,367**	,246*	,229*	,259**	,288**	,466**	,328**	,317**	,452**	,155	,173	,285**	,427**	,229*						
16. limitations -basic	,339**	,189	,136	,183	,328**	,342**	,265**	,111	,286**	,085	,118	,209*	,387**	,287**	,778**					
17.limitations -relationships	,211*	,242*	,161	,222*	,126	,371**	,271**	,337**	,400**	,248*	,190	,291**	,249*	,149	,675**	,237*				
18. care and support	,243*	,037	,017	,025	,038	,082	,158	,009	,090	-,046	,239*	,251	,189	,212*	,368**	,365**	,154			
19. positive influences	,033	,043	,079	,113	,009	-,052	,121	,005	,016	,042	,027	-,004	-,086	-,129	,033	-,039	,001	-,093		
20. negative influences	,324**	,380**	,236*	,370**	,349**	,271**	,378**	,259**	,355**	,320**	,118	,256**	,254*	,022	,434**	,319**	,252*	,137	,085	

21. need for care	,217*	,341**	,160	,290**	,145	,301**	,292**	,280**	,350**	,143	,227*	,139	,318**	,309**	,495**	,423**	,424**	,317**	-,121	,308**

* .05 (2-tailed) significant ** .01 (2-tailed) significant