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A first step towards validation of the DASS-21 as depression screener for individuals with a Mild and Borderline Intellectual Disability, who have Substance Use Related and Addictive Disorders

Maritte Tilkema

University of Twente – Enschede

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Positive psychology and technology

1st internal supervisor: dr. M.E. Pieterse

2nd internal supervisor: dr. J.E.L. van der Nagel

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Abstract

Background: Comorbidity is a common problem among patients who are in treatment for substance use related and addictive disorders (SUD/AD). For instance, a part of the patients with SUD/AD also have a mild- or borderline intellectual disability (MBID). Sometimes even triple problems exist by existence of an additional psychiatric disorder. This points to the importance of systematic screening for comorbidity, during treatment of SUD/AD. However, screening instruments validated for the population with MBID are scarce. This accounts for depression screeners, for instance. Depression is a common comorbidity among patients with SUD/AD. However, among persons that are MBID the diagnosis is often missed.

Purpose: Currently, the DASS-21 is the preferred depression screener for patients with SUD/AD and MBID, at an organisation for addiction care. This questionnaire is not yet validated among this population though. Therefore, the purpose of this study is to make a first step towards validation of the DASS-21 depression subscale (DASS-21) among this population.

Method: By convenience sampling twelve patients, who are in clinical treatment within a MBID department of an organisation for addiction care since September 2018, are included in the study. The construct validity of the DASS-21 is examined by performing regression analyses between this questionnaire and the BDI-II-NL (BDI-II), the SDQ-18 emotional problems subscale (SDQ-18), and Honos item 7 (Honos). Besides this, a moderator analysis is selected to examine whether IQ level influences the relationship between the DASS-21 and the BDI-II. Lastly, a crosstab analysis is performed to verify the sensitivity and specificity of the DASS-21, by comparing its cut-off score with the cut-off scores of the BDI-II.

Results: Results of the regression analyses show a strong, positive relationship between the DASS-21 and BDI-II, that is also significant. The relationships between the DASS-21 and the SDQ-18, and the DASS-21 and the Honos appeared to be moderately positive. Though, these results are non-significant. Crosstab analyses show that the cut-off score of the DASS-21 is most sensitive and specific in comparison to the cut-off score of the BDI-II severe depression. A DASS-21 cut-off score of 15 seems to correspond most accurate to the cut-off score of the BDI-II moderate depression. With reference to the small study sample, the moderation analysis could not be performed.

Conclusion: There are indications that the DASS-21 is a valid depression screener for individuals with MBID, who have a SUD/AD. However, future research is necessary to confirm this.

Samenvatting

Achtergrond: Comorbiditeit komt regelmatig voor bij patiënten die in behandeling zijn voor verslaving. Een voorbeeld hiervan is de combinatie van verslaving en een licht verstandelijke beperkt- of laag begaafd niveau van functioneren (LVB). Er kan zelfs sprake zijn van triple problematiek, wanneer hiernaast nog een psychische stoornis bestaat. Bij de behandeling van verslaving is het daarom van belang dat er systematisch gescreend wordt, om bestaande comorbiditeit aan het licht te brengen. Momenteel zijn echter weinig screeningsinstrumenten gevalideerd voor de LVB doelgroep, waaronder screeningsinstrumenten voor depressie. Comorbide depressie komt veel voor bij mensen met verslaving. Daarnaast blijkt dat depressie nogal eens over het hoofd gezien wordt bij mensen met een LVB.

Doel: Momenteel gebruikt een organisatie voor verslavingszorg de DASS-21 vragenlijst om patiënten met verslaving en een LVB te screenen op depressie. Deze lijst is echter nog niet gevalideerd voor deze doelgroep. Het doel van dit onderzoek is dan ook om een eerste stap richting validatie van deze vragenlijst te maken voor deze doelgroep.

Methode: Middels een gemakssteekproef zijn twaalf patiënten, die sinds september 2018 klinisch opgenomen zijn op een LVB-afdeling van Tactus, meegenomen in het onderzoek. De validiteit van de DASS-21 depressie sub-schaal (DASS-21) is onderzocht door de relaties tussen deze vragenlijst en de BDI-II-NL (BDI-II), de SDQ-18 emotionele problemen sub-schaal (SDQ-18) en Honos item 7 (Honos), middels regressie analyses te onderzoeken. Daarnaast is onderzocht of IQ level invloed heeft op de relatie tussen de DASS-21 en de BDI-II, middels een moderator analyse. Ten slotte is middels een kruistabel de sensitiviteit en specificiteit van de DASS-21 onderzocht, door zijn afkapwaarde te vergelijken met de afkapwaarden van de BDI-II.

Resultaten: Resultaten van regressie analyses laten zien dat er een sterke, positieve relatie bestaat tussen de DASS-21 en de BDI-II, die significant is. Tussen de DASS-21 en de SDQ-18 en de DASS-21 en de Honos blijken gemiddelde, positieve relaties te bestaan. Deze resultaten zijn echter niet significant. Kruistabel analyses laten zien dat de afkapwaarde van de DASS-21 het meest sensitief en specifiek is in vergelijking met de afkapwaarde van de BDI-II ernstige depressie. Een afkapwaarde van 15 voor de DASS-21 blijkt het meest accuraat overeen te komen met de afkapwaarde van de BDI-II gemiddelde depressie. De moderator analyse kon in verband met het lage respondentenaantal niet uitgevoerd worden.

Conclusie: Er zijn aanwijzingen dat de DASS-21 een valide depressie screener is voor mensen met een LVB en verslaving. Verder onderzoek is echter nodig ter bevestiging hiervan.

A first step towards validation of the DASS-21 as depression screener for individuals with a mild and borderline intellectual disability, who have substance use related and addictive disorders

Substance use disorder (SUD) is a common problem within society, also amongst individuals with mild to borderline intellectual disability (MBID) (Hammink & Schrijvers, 2012). Individuals have a MBID when their IQ level is between 50/55 and 85 (Wechsler, 2012). The “National drug monitor 2017” of the Trimbos Instituut (Trimbos Institute) (2017) reports 82.400 people with alcohol dependency and 395.600 people with alcohol abuse in 2007-2009. In the same period of time there are 29.300 people with cannabis dependency, 40.200 people who abuse cannabis, 22.000 people are dependent of sedatives and tranquillizers, and 35.000 people abuse sedatives and tranquillizers. In 2012 approximately 14.000 people are problematic users of hard-drugs (Trimbos Instituut, 2017). In a study, Ouweland, Kuijpers, Wisselink, and Van Delden (2010) found that over 72.000 people receive addiction care for a substance use related and/or addictive disorder (SUD/AD), of which the vast majority for a disorder in alcohol use (34.646). Little is known about the extent of SUD/AD among the population with MBID. Exploratory research, among 760 adolescents with MBID in the age of 12 to 25 years old, showed that 21% of the participants used drugs and two third used alcohol occasionally or regularly (Bransen, Schipper, & Blekman, 2009). Slayter (2010) revealed in a study among 9.484 individuals with MBID that 2.6% of these individuals abuse substances. In another study of Taggart, McLaughlin, Quinn, and Milligan (2006), of the 67 individuals with MBID and SUD/AD, alcohol was shown to be the main substance of misuse. A fifth of these individuals also poly-drug use illicit drugs and/or prescribed medication. Being MBID was shown to be a risk factor for developing a SUD/AD (Taggart et al., 2006). Slayter (2010) states that the community participation of individuals with MBID increases since deinstitutionalization. This facilitates the access to illicit drugs and alcohol. According to Dijkstra, Bransen, and Leeman (2011) experimental behaviour with these substances can easily develop into excessive use through difficulties with cognitive inhibition of behavior.

When individuals with MBID and SUD/AD also have a psychiatric disorder, comorbid/triple problems exist. For example, a SUD/AD with comorbid depression seems common (Watkins et al., 2004). Vollebergh et al. (2003) state that 43% of males with a mood disorder and 15% of women with a mood disorder also have a SUD/AD, at a given time. Results from a national epidemiologic survey, conducted in the United states among 43093 individuals, show that nearly 20% of the respondents with a SUD/AD simultaneously had a

mood disorder (Grant et al., 2006). According to Grant et al. (2006) 32.75% of the individuals diagnosed with an alcohol use disorder (5.81%) met the criteria for a major depression. Of the individuals with a drug use disorder (13.10%) 44.26% also appeared to have a major depression. Symptoms of depression are often substance induced and abate quickly by abandoning substance use (Schuckit, 2006). A study of Davidson (1995) showed that 67% of patients with an alcohol addiction also had a major depression. After detoxification from alcohol the percentage of patients being depressed decreased to 13%. Therefore, for the purpose of conducting reliable diagnostic research, the Nederlandse Vereniging voor Psychiatrie (Dutch society for psychiatry) (2009) recommends to wait with screening for comorbid depression until patients are at least 2-3 weeks abstinent. For other substances there are no unambiguous guidelines for a required period of abstinence. However, the clinical advice remains to wait at least 2-3 weeks before screening for depression (Nederlandse Vereniging voor Psychiatrie, 2009). According to Popma, Blaauw, and Bijlsma (2012) SUD/AD and comorbid psychiatric disorders seem to influence each other in persistence and severity. Thus, to prevent these problems to amplify each other it seems important to treat both. According to Van der Nagel (2018) systematic screening is necessary to identify these comorbid problems. Otherwise, there is high risk of comorbid problems remaining untreated. Different studies show that depressive disorders among individuals with MBID often are being overlooked by clinicians (Mileviciute & Hartley, 2013; Lakeman, Boddien, & Tromp, 2017). According to Lakeman et al. (2017) a possible cause for this are the similarities between the symptoms featuring MBID and featuring depression. Questionnaires used to screen depression with, are available as self-report questionnaires, and as informant-measures. A study of Mileviciute and Hartley (2013) showed a higher frequency of affective and cognitive symptoms of depression reported by persons with MBID in self-reported questionnaires, than reported by informants within informant measures. Thus, informants seem to overlook information regarding affective and cognitive symptoms of depression more easily. Another problem with screening for psychiatric problems such as depression, is that screening instruments that are appropriate for individuals with MBID are scarce (Douma, Moonen, Noordhof, & Ponsioen, 2014; Van Duijvenbode et al., 2015). Therefore, a lot of instruments only validated for individuals without MBID are used for individuals with MBID. In order to still obtain reliable and useful test results, it is important to account for the specific features of individuals with MBID (Douma et al., 2014), such as: reduced ability to concentrate, difficulties with self-reflection and with abstraction, limited linguistic and

reading level, and difficulties with reading comprehension (Douma, 2018; Van der Nagel, Kiewiek, & Didden, 2017).

Besides the necessity of adapting diagnostic research to the specific features of MBID, also treatment interventions need to be adapted to these features (Douma, 2018). An organization with clinics that have specialized departments for treating individuals with MBID who have a SUD/AD is Tactus. Currently, Tactus uses the MATE-outcomes 2.1 (Measuring Addictions for Triage and Evaluation-outcomes 2.1) (Schippers & Broekman, 2011) as intake- and Routine Outcome Monitoring (ROM) instrument with their patient population that is MBID. Its purpose is determining patient characteristics, in order to define the required care and treatment and to evaluate provided care and treatment. However, according to Van der Nagel, Kemna, Barendregt, and Wits (2017) the length of the instruments and the complexity of the questions included in the MATE-outcomes 2.1, seem to constitute a substantial threshold for individuals who are MBID. Therefore, Tactus started the so called MID-ROM study, to compile a test battery appropriate to use as ROM instrument for their patients with MBID who have SUD/AD. This final ROM instrument can then be used for the purpose of indication for care and treatment and the evaluation of the provided care and treatment.

The currently used ROM instrument “MATE-outcomes 2.1” includes the DASS-21 questionnaire to screen for depression (Schippers & Broekman, 2011). The purpose of this questionnaire is to distinguish between symptoms of depression, anxiety, and stress. (De Beurs, Van Dyck, Marquenie, Lange, and Blonk, 2001). In this study only the depression subscale of the DASS-21 is used. The depression-subscale measures principally absence of positive feelings (De Beurs et al., 2001). The DASS-21 is translated into a Dutch version, which has similar psychometric properties as the original English version. A study of Gloster et al. (2008) shows a highly consistent three factor structure ($SRMR \leq 0.08$; $RMSEA \leq 0.06$; $CFI/TLI \geq 0.9$). The internal consistency is excellent for the DASS-21 total score ($p = .94$) and for the depression subscale ($p = .87$). The study results support the convergent validity of the depression subscale ($r = .76$; $p < .0001$). And also the discriminant validity of the depression subscale is supported, since participants with a mood disorder scored significantly higher on the depression subscale than participants with a generalised anxiety disorder (GAD) (mood disorder: $\beta = .69$; $p < .001$), and significantly higher than participants with no diagnosis (mood disorder: $\beta = 1.52$, $p < .001$) (Gloster et al., 2008; Brown, Chorpita, Korotitsch, and Barlow, 1997). No specific literature is found about the utility of the DASS-21 questionnaire

among individuals with MBID. Taking into account that, according to Douma (2018) and Van der Nagel, Kiewiek, & Didden (2017), the linguistic, reading level, and reading comprehension of individuals who are MBID are limited, it could be that the lower the IQ level of respondents, the higher the chance they misunderstand questions. This could cause differences in depression scores. To examine whether the outcome of the DASS-21 questionnaire differs depending on IQ level, research is necessary.

Although, the DASS-21 is not yet validated for the population with MBID, it currently is the preferred depression screener for Tactus her patient population that is MBID. The purpose of this study is to make a first step towards validation of the DASS-21 depression subscale (hereafter referred to as 'DASS-21') for this population. Firstly, by comparing the test results of the DASS-21 with the test results of the other depression screeners that are included in the MID-ROM study of Tactus. These are the SDQ-18 subscale 'emotional problems' (referred to as 'SDQ-18'), Honos item 7 (referred to as 'Honos'), and the BDI-II-NL (referred to as 'BDI-II'). Secondly, it is examined whether the DASS-21 scores differ depending on IQ level, by analysing whether IQ level moderates the relationship between the DASS-21 and the other depression screeners. In that case, the DASS-21 might be less valid to use as depression screener for individuals with MBID. The following research question is formulated:

“Is the DASS-21 a valid instrument to use as depression screener for individuals with MBID, who have a substance use related- and/or addictive disorder?”

The following sub-questions are formulated to answer the research question:

- “Do the scores of the participants on the BDI-II, SDQ-18, and Honos, correlate significantly with their results on the DASS-21?”
- “Does IQ level moderate the relationship between the DASS-21 and the BDI-II?”

The results of this study can contribute to the validation of the DASS-21, among the population with MBID. Besides that, the results can contribute to the decision-making of whether or not the DASS-21 should be maintained as depression screener, for the patient population of Tactus that has a MBID. When the study results show strong correlations between the DASS-21 and the BDI-II, the SDQ-18, and the Honos, the DASS-21 could possibly be maintained as depression screener.

Method

This observational study is conducted by use of cross-sectional data. There is a four week time lag between the data of the BDI-II and the other depression screeners (DASS-21, SDQ-18, and Honos), however, there are single measurements of all instruments.

Participants

This study contains a sample of twelve participants who receive clinical treatment in one of the MBID departments of Tactus Rekken. The mean age is 34,13 (sd = 9,49; range 22 - 53 age). Depending their diagnosis, some participants take medication. Generally, patients remain in treatment for eight to 10 weeks. Patients with MBID that initiating treatment from September 2018 are included by convenience sampling, on voluntary basis. Inclusion criteria are a MBID diagnosis (IQ = 50 - 85), an age of 18+, abstinence of alcohol and drugs, except for tobacco and psychopharmaceuticals, for at least one week at the start of the treatment, and proficiency of the Dutch language. Patients who do not master the Dutch language are excluded from the study. All participants have at least the comorbidity SUD/AD and MBID. Besides that, some patients are even triple-diagnosed with an additional psychiatric disorder, but this is no prerequisite for inclusion to the study. After five weeks of treatment all depression screeners used in this study are completed by the participants. Therefore, a minimal treatment duration of five weeks is required for participation to this study. In Appendix A, table 1 an overview of the patient characteristics is given. All participants took notification of the conditions for participating in this study and signed the informed consent.

Apparatus

In this section a description of all test materials used for this study follows.

DASS-21 (self-report measure)

The DASS-21 is the short form of the original DASS-42 questionnaire. Beurs et al. (2001) describe that the questionnaire consists of 21 items that comprises three subscales of seven items each, measuring depression (items 3, 5, 10, 13, 16, 17, 21), anxiety (items 2, 4, 7, 9, 15, 19, 20), and stress (items 1, 6, 8, 11, 12, 14, 18). In this study only the depression subscale is used. The items are answered according to a four point-Likert scale, where 0 means “did not apply to me at all” and three means “applied to me very much, or most of the time”.

According to Schipper and Broekman (2011) the sum of the item-scores have to be multiplied

by two, in order to obtain a scale score that is comparable with the DASS-42 scale score. Cut-off scores are developed to indicate depression (>21 for the depression subscale), anxiety (>15 for the anxiety subscale), and stress (>26 for the stress subscale) (Schipper and Broekman, 2011). Studies performed among clinical- and student samples by Beurs et al. (2001), Brown, Chorpita, Korotitsch, and Barlow (1997), and Gloster et al. (2008) show an excellent internal consistency of the subscales. According to the founded item-rest correlations each subscale appears to be represented by a homogeneous set of items. The test-retest reliability appeared to be sufficient reliable for the 42-item version, but questionable for the 21-item version. The high correlation between the depression subscale of the DASS-21 and the BDI ($r=.68$) supports the convergent validity of the DASS (Beurs et al, 2001).

BDI-II-NL (self-report measure)

The BDI-II-NL is an inventory, developed to measure symptoms of depression with individuals aged from 13 years old (Van der Does, 2002). By presence of symptoms additional research is necessary to diagnose depression. The questionnaire contains 21 items and each single item is scored on a four point scale, ranged from 0-3 points. The respondent chooses one of the four statements that describes his/her feelings during the past two weeks most accurate. The total scale is distinguished into three subscales, these are: emotional subscale (five items), cognitive subscale (seven items) and somatic subscale (nine items) (Van der Does, 2002). However, Brouwer, Meijer, and Zevalkink (2013) state that solely interpreting the total scale score can reflect a reliable conclusion, since they did not find enough justification for multidimensionality. Cut-off scores to determine the severity of the depression are: 0-13 (minimal depression), 14-19 (mild depression), 20-28 (moderate depression), and ≥ 29 (severe depression) (Smarr & Keefer, 2011). Arbisi and Farmer (2015) state the psychometric properties of the BDI-II-NL to be quite sound. Studies of Storch, Roberti, and Roth (2004), and Dozois, Dobson, and Ahnberg (1998) yield results supporting the concurrent validity and a high internal consistency of the BDI-II-NL. According to Van der Does (2002) the COTAN reviewed the reliability as sound, the construct validity as sufficient, and the norms and criterion validity as insufficient due to a lag of research. Minimal information about the usability of the BDI-II among the population with MBID is available. However, a British study of Lindsay and Skene (2007) suggests that the BDI-II can be used reliably with individuals who have an intellectual disability.

SDQ-18 (self-report measure)

The SDQ-18 is a questionnaire, developed by Goodman, to screen individuals from three years and older with high risk on psychosocial problems. Several versions are developed, based on aging group. Besides that, they are available as self-report version, parent version and teacher version. This study uses the SDQ-18 self-report version. In 2001 this questionnaire is translated into Dutch by Treffers and Van Widenfelt (Stinissen, 2009). The SDQ-18 measures the presence of strengths and difficulties that influence daily functioning by use of 25 items, related to the five subscales: 1) hyperactivity, 2) emotional problems, 3) peer problems, 4) conduct problems and 5) pro-social behavior (Stinissen, 2009). Each subscale contains five items, that can be scored as 'not true' (score = 0), 'somewhat true (score = 1)', or 'certainly true' (score = 2). Each subscale can range from 0-10. The SDQ-18 produces a 'total difficulty score', that ranges from 0-40, by summing up all subscales, except for the pro-social scale. Each single point of increase on the SDQ-18 score corresponds to an increasing chance of having a certain disorder. The higher the 'total difficulty score', the greater psychopathology (Goodman & Goodman, 2009). To audit daily functioning and to evaluate specific intervention, pre- and post-measures of the SDQ-18 can be used (<http://www.sdqinfo.com/>). To subdivide SDQ scores among a categorical classification, that indicates to which extent possible problems exist, cut-off scores are created. However, these are only validated for the SDQ 4-17 versions for 4-17 year olds. These cut-off scores for the total difficulties score are 15-17 (slightly raised problems), 18-19 (high problems), and 20-40 (very high problems). The cut-off scores for the emotional problems subscale are 5 (slightly raised), 6 (high), and 7-10 (very high). Although, the scoring instructions for the SDQ 4-17 version and the SDQ-18 version are similar, the cut-off scores are not yet validated for the SDQ-18 version, and therefore cannot be interpreted reliably (<http://www.sdqinfo.com/>). Several studies provide information about the validity and reliability of the SDQ 4-17 version, such as a good concurrent validity, a good internal consistency of the teacher version, and a generally acceptable internal consistency of the parent version and self-report version (Van Widenfelt, Goedhart, Treffers, & Goodman, 2003). By use of an explorative factor analyses, a study of Vogels, Crone, Hoekstra, and Reijneveld (2005) found that the subscale structure of the SDQ should be rejected. However, information about the validity and reliability of the SDQ-18, and its usability among the population with MBID, is currently unknown.

Honos (informant measure)

The Honos questionnaire is developed to give insight in the extent of problems and the changes on different life areas, concerning the mental health and the social functioning of patients in mentally health care institutions (Mulder et al., 2004). The Honos consists of 12 items, divided among the four subscales: conduct problems (items 1-3), disabilities (items 4-5), symptomatology (items 6-8), and social problems (items 9-12). The items are measured by a five-points-Likert-scale, from 0 (no problem), 1 (low), 2 (moderate), 3 (high), to 4 (very high). The questionnaire is an informant measure that has to be completed by a doctor, a nurse or by other mental health workers. Besides the original Honos several versions are developed specifically for elderly, children and adolescents, children with learning problems, individuals with cognitive disorders, and for the forensic psychiatry. For this study only item seven of the original Honos questionnaire is used to analyse. Item seven measures “depressive mood”. Mulder et al. (2004) found a sufficient – good interrater reliability (IRR = ,80) of Honos item seven. Besides this, the mean score on item seven (depressive mood), was significant higher among patients diagnosed with a depressive disorder ($p < .001$), compared to patients without this diagnosis. Concerning the practical properties, social workers experience the Honos as usable to require insight in changes on relevant life areas and in the conditions of patients, in order to develop a health plan (Mulder, et al., 2004). Studies regarding the usability of the Honos among the MBID population are unavailable.

Wechsler Adult Intelligence Scale, fourth edition (WAIS-IV)

The WAIS-IV is an instrument to measure the cognitive ability of adults, aged from 16:0-90:11 years old, and has to be administered individually by a trained psychologist (Pearson, 2008). Lichtenberger and Kaufman (2009) describe that by use of ten subtests, four specific indexes of intelligence and the total IQ (TIQ) score are computed. The index *verbal comprehension*, is measured with the subtests “similarities”, “vocabulary”, “information”, and supplemental subtest “comprehension”. The subtests “Block design”, “matrix reasoning”, “visual puzzles” and supplemental subtests “picture completion” and “figure weights” (16-69 years old only), are needed to measure the index *perceptual reasoning*. To test *working memory*, the subtests “digit span” and “arithmetic”, and the supplemental subtest “letter-number sequencing” (16-69 years old only) are needed. And lastly, *processing speed* is computed with the subtests “symbol search” and “coding”, and the supplemental subtest “cancellation” (16-69 years old only) (Lichtenberger & Kaufman, 2009). Pearson (2008)

states that after scoring the test-results, raw scores are converted into norm-based scaled scores which can be used for a variety of purposes, such as, for identifying psychological disabilities. These norm-based scaled scores of the TIQ and the four indexes have a mean of 100 and a standard deviation of 15 (Lichtenberger & Kaufman, 2009). The intercorrelations between the subtests of the WAIS-IV, ranging from $r = .15$ to $r = .71$, support the construct validity. Besides that, existence of the four indexes is supported by high correlations of the subtests with the index scores they are part of (Hendriks, Barelds, & Vanhecke, 2015). Wechsler (2012) states that the reliability of the WAIS-IV index scores is solid with values around 0.90 and that the total IQ score has a high average reliability of 0.97. The generalizability of both the index scores and the total IQ score is high, with generalizability coefficients of 0.70-0.87 (Wechsler, 2012).

Procedure

To collect all required data, several instruments of the test battery compiled for the MID-ROM study of Tactus are used. These are the DASS-21, the BDI-II, the SDQ-18, the Honos, and the WAIS-IV. The BDI-II, the SDQ-18, the Honos, and the WAIS-IV are taken by psychologists in training. The DASS-21 is taken by caregivers who guidance the respondents on the department where they reside. By e-mail, the caregivers are informed about the study and instructed how to perform the study. Schemes are established to monitor on which data each instrument needs to be completed, for each individual participant. The DASS-21, SDQ-18, and Honos need to be completed after one week of treatment. The BDI-II and the WAIS-IV need to be completed after five weeks of treatment. For the participants an information brochure and informed consent are drawn up. Before starting testing, the participants read the information brochure and they signed the informed consent. After testing, all gathered data is saved in a SPSS dataset that is kept in an encrypted file in the computer system of Tactus. Only authorised persons can get access to this file. The hard copy of the completed questionnaires are saved in a binder that is kept in a locked file cabinet.

Data-analysis

All data is analysed by use of the program “Statistical Package for Social Sciences” (SPSS), version 23. Beforehand, all negative items of the SDQ-18 are recoded. Regarding the small sample ($n = 12$), it is decided not to exclude the respondents who have an IQ level of >85 according to the WAIS-IV ($n = 2$).

By use of frequency tables insight in respondent characteristics is provided. Insight in the number of participants being MID or BIF is perceived by recoding the variable 'WAISIV_TIQ' into a three-category, ordinal variable, with the categories: '1 = IQ 50-70', '2 = IQ 71-85', and '3 = IQ 86 – 100'.

Simple linear regression analyses are conducted, to examine the extent and direction of the relation between the scores of the participants on the DASS-21 and the BDI-II, SDQ-18, and Honos. The BDI-II and the Honos contribute to the construct validity of the DASS-21, since they also pretend to screen for depression. The SDQ-18 does not measure depression in particular, but it measures the presence of emotional problems, that are also common with depression. Therefore, this instrument contributes to verifying the convergent validity of the DASS-21. The DASS-21 is selected as the dependent variable, the BDI-II, SDQ-18, and Honos are selected as independent variables. All variables are measured on interval level by using the raw total scores on the questionnaires. Firstly, a scatter chart is used to verify whether there is a linear correlation between the DASS-21 (Y-as) and the BDI-II, SDQ-18, and Honos (X-as), and to detect outliers. Outliers that might influence the regression line are examined by calculating Cook's distances for all observations. An observation is an outlier when its Cook's distance exceeds the cut-off for Cook's distance. These cut-offs are calculated for every regression analysis separately by $4/n$, where n is the number of observations. Regarding the small sample (<30), extreme scores may confound the test results (Baarda, De Goede, & Van Dijkum, 2007). Secondly, the simple linear regression analysis is executed. With this analysis the strength and direction of the relationship between the DASS-21 and the BDI-II, the DASS-21 and the SDQ-18, and the DASS-21 and the Honos is indicated, by use of the standardized regression coefficient Beta. The relationship is strong if $Beta = \geq .50$ and it is significant if $p < 0,05$ (Cohen, 1988). Beside this, the confidence interval of the regression coefficient is estimated to be able to account for standard error, by reporting an interval estimate. This enables to determine the insecurity of the observed coefficient. A strong relationship ($Beta = \geq .50$; $p < 0.05$) between the DASS-21 and the other depression screeners is indication for the construct and convergent validity of the DASS-21. It is expected that there will be a strong relationship between de DASS-21 and the other depression screeners.

Regarding the small sample ($n = <30$), also a non-parametric analysis is executed, to confirm the findings of the regression analyses while correcting for any non-normal distributions. Since the DASS-21 uses a single cut-off score to indicate depression, rather than

measuring the extent of depression on ordinal level, the raw scores of all questionnaires are used for these analyses. When $r_s = \geq .50$ ($p < 0.05$) correlation is high (Cohen, 1988). Subsequently, only the depression screeners revealing a meaningful result by the simple linear regression- and the spearman correlation analyses are further analysed.

A moderation analysis is applied to examine whether a differential effect of the BDI-II on the DASS-21 occurs, as a function of IQ level. Moderation occurs when the strength or the direction of the relationship between the independent variable and the dependent variable changes as the moderator changes (Baron & Kenny, 1986). For this analysis, the DASS-21 is selected as dependent variable (Y), the BDI-II as the predictor variable (X), and IQ level as the moderator variable (Z). Firstly, the BDI-II scores and the IQ scores are transformed into centralised variables. Secondly, the centralised interaction term (XZ) is computed by multiplying the centralized predictor variable by the centralized moderator variable. Thirdly, the centralized moderator, -predictor, and -interaction term are added to the regression equation as independent variables. The DASS-21 is added as dependent variable. A significant interaction effect of a correlation different from 0, implies moderation of IQ level on the relationship between the DASS-21 and the BDI-II. This moderator hypothesis is supported when the p-value is < 0.05 (Cohen, 1988). It is expected that IQ has no moderation effect on the relationship between the DASS-21 and the BDI-II.

Crosstab analyses are applied to study the sensitivity and specificity of the DASS-21 cut-off score, in comparison with the BDI-II cut-off scores indicating mild, moderate, and severe depression. Firstly, derived from the existing cut-off scores, binary variables of the DASS-21, BDI-II mild depression, BDI-II moderate depression, and BDI-II severe depression are created, with the categories '1 = depressed', and '2 = non-depressed'. Subsequently, by their raw scores, respondents are assigned to the correct category. In the crosstab analyses the binary variable of the DASS-21 is selected as row variable. The binary variables of the BDI-II mild depression, BDI-II moderate depression, and BDI-II severe depression are selected as column variables. The sensitivity and specificity of the DASS-21 is determined by comparing the proportion of correspondence of the cut-off scores of the DASS-21 with the cut-off scores of the BDI-II.

Results

Simple linear regression

Scatterplots of the DASS-21 scores with the BDI-II-, the SDQ-18-, and the Honos scores are appended as figures in Appendix B. The scatterplot in Appendix B, figure 1 shows a strong positive relationship between the DASS-21 and the BDI-II ($R^2 = .53$). The Cook's distances range from .000 - .352. The cut-off for Cook's distance of 0.40 is not exceeded, indicating no bias due to outliers. The scatterplot in Appendix B, figure 2 shows a moderate positive relationship between the DASS-21 and the SDQ-18 ($R^2 = .22$). The Cook's distances, that range from .000 - .354, do not exceed the cut-off score of 0.36. Appendix B, figure 3 shows a moderate positive relationship between the DASS-21 and the Honos ($R^2 = .23$). The Cook's distances, ranging from .000 - .234, do not exceed the cut-off for Cook's distance of 0.40. The relationship between de DASS-21 and the BDI-II is strong and significant (Beta = .73; $p = .017$; $n = 10$). The 95% CI of the unstandardized coefficient (B = .622) lies between .15 and 1.10. The relationship between the DASS-21 and the SDQ-18 appears to be moderately positive and not significant (Beta = .46; $p = .151$; $n = 11$). The 95% CI of the unstandardized coefficient (B = .2.71) lies between -1.20 and 6.61. The relationship between the DASS-21 and the Honos is also moderate and not significant (Beta = .48; $p = .190$; $n = 9$). The 95% CI of the unstandardized coefficient (B = 10.29) lies between -6.48 and 27.05. Additionally, to estimate the certainty of the non-significant results of the regression analyses, the observed power of these results are calculated. The observed power of the non-significant result of the regression analysis with the SDQ-18 (power = 0.44), and of the regression analysis with the Honos (power = 0.39) appeared to be low. In addition to the simple linear regression, the non-parametric Spearman correlation analysis is executed. This analysis shows a strong, positive relationship between the DASS-21 and the BDI-II, that is not significant ($r_s = .63$; $p = .051$; $n = 10$). The relationship between de DASS-21 and the SDQ-18 ($r_s = .46$; $p = .158$; $n = 11$), and between the DASS-21 and the Honos ($r_s = .54$; $p = .131$; $n = 9$) both appear to be moderate positive, yet non-significant.

Moderator analysis

With respect to the small sample of this study, it is decided not to apply the moderator analysis. To execute the moderator analysis in further research, the syntax included in appendix C can be used.

Crosstab analysis

The output of the crosstab analyses show that the cut-off score of the DASS-21, corresponds most accurate with the cut-off score of the BDI-II that indicates severe depression (Appendix D, table 2). The sensitivity and specificity are 100%, thus, no false negatives or false positives are found. In comparison with the BDI-II cut-off score that indicates a moderate depression (Appendix D, table 3), the specificity of the DASS-21 is 88,9% and the sensitivity is 50%, by indicating eight true negatives and one false negative. Three false negatives against six true negatives are indicated by the DASS-21 when compared to the BDI-II cut-off score that indicates mild depression (Appendix D, table 4). Herewith, the specificity is 66,7% and the sensitivity is 25%. An additional crosstab analysis is executed to determine the most accurate cut-off score for indicating a moderate depression by use of the DASS-21. Appendix D, table 5 shows that the sensitivity and specificity of the DASS-21 compared to the BDI-II moderate depression is 100%, when utilising a DASS-21 cut-off score of 15.

Discussion

Main findings

The purpose of this study was to make a first step towards validation of the DASS-21 among persons that are mild- or borderline intellectual functioning (MBID), who are in treatment for a substance use- or addictive disorder (SUD/AD). Based on a strong correlation with the BDI-II, the finding tentatively suggest that the DASS-21 is a valid instrument to assess depressive symptoms in individuals with MBID, who are in treatment for a SUD/AD. This could only be partly confirmed by comparisons with the SDQ-18 and Honos, though. The results of the crosstab analyses suggest that the DASS-21 is qualified to indicate for depression, provided that it is a severe depression. The sensitivity and specificity for indicating a mild and moderate depression seems much lower. In order to be able to indicate for a moderate depression, it seems that a lower cut-off score of the DASS-21 should be considered.

Discussion, limitations and suggestions for future research

Although, results are found that support the validity of the DASS-21, it is important to bear in mind that all these analyses are based on the scores of at most 12 participants. An advantage of the small sample size is that this new research question could be preliminary examined, without spending too many resources, such as subjects, money and time. Yet, this small

sample size is also one of the biggest limitations of this study. It reduces the statistical power, thus, the found estimates might be less reliable and precise. The small study sample also increased the chance on deviation from a normal distribution. Therefore, the executed parametric analyses could have provide biased results. This increases the likelihood of drawing false conclusions. Therefore, the results have to be interpreted with great caution. Future research with a larger number of participants should probably provide more reliable results. However, this does not imply the current results are not valuable at all. Despite the small sample, strong, positive correlations are found. These results do provide preliminary evidence in favour of validation of the DASS-21 among the population with MBID, who have a SUD/AD. Yet, it should be noted that the point estimate that indicates the high correlation is very uncertain, since the confidence interval is broad. However, it is very meaningful that a significant correlation is found despite that the sample is very small, since it denotes a very high effect. To obtain support for the found correlations of the parametric regression analyses, while correcting for any non-normal distributions, non-parametric 'Spearman' analyses are executed. The results of the Spearman analyses seem to confirm the result of the regression analysis regarding the strong, positive correlation that is found between the DASS-21 and the BDI-II. The significance level of this analysis is reduced to being non-significant, however. Therefore, this found correlation could be due to chance, and thus, the correlation of the Spearman analysis is too unsure to confirm the relationship that is found by the regression analysis.

Because of the small study sample, also the question arises whether there is evidence for selection bias. Selection bias can cause homogeneity of the sample, and consequently, the sample might not be representable for Tactus her general patient population with MBID. There are several reasons to clarify the sample remained small. Firstly, there was a lower influx of new patients than expected in advance. Secondly, there were five drop-outs because of too short treatment duration to collect all required data. Thirdly, presumably, in one case it is forgotten to fill in all required questionnaires. Since the small sample seems primarily due to practical reasons, presence of selection bias seems unlikely. Besides that, the regression models showed no presence of influential observations. This implies, there are no deviant participants that might have influenced the regression line. These findings increase the probability that the sample represents Tactus her general patient population who are MBID, what benefits the generalizability of the current study results.

When interpreting the characteristics of the sample it occurs that the great majority exists of male participants, since during the sampling period particular men started clinical treatment. Of the 12 participants solely one participant is female. According to Ouwehand, Kuijpers, Wisselink, and Van Delden (2010), approximately 20% of patients entering addiction care are female and 80% are male. Thus, in this study females seem somewhat underrepresented in comparison to the number of females in the general population that enter addiction care. It is unknown whether this might have influenced the correlation between the DASS-21 and the BDI-II, partly since thorough research to norms of the BDI-II is absent (Van der Does, 2002). As regards the main substance of use, the participants of the current study are addicted to alcohol, cannabis, stimulantia, cocaine, or a combination of two of these substances. Therefore, the possible influence of other substances, such as opiates, ecstasy, gamma hydroxybutyrate (GHB), and sedatives could not be examined. However, it seemed that the main substance of use did not negatively influence the current study results, on the grounds that the DASS-21 and the BDI-II correlate strongly. If the main substance of use would have negatively influenced depression rates, it might be assumed that the correlation would be weaker. A characteristic that could have influenced the correlation between the DASS-21 and the other depression screeners is the IQ level of the participants. The IQ level of the majority of the participants varies from mild intellectual disabled (MID) to borderline intellectual functioning (BIF). Two deviant participants are included, having a low to average IQ level. There is one reference stating that the BDI-II is suited to use for the population with MBID (Lindsay & Skene, 2007). Taking this into account, it would be expected that the DASS-21 also is suitable to use for individuals with MBID, since it correlates highly positive with the BDI-II. To find additional evidence for this hypothesis, it was intended to measure whether IQ level moderates the strength of the relationship between the DASS-21 and the BDI-II by use of a moderator analysis. This could have provided information about the usability of the DASS-21 among the population with MBID. A reduced strength of the correlation with the BDI-II for individuals with MID, in correspondence to individuals with BIF, might have presumed that the lower the IQ level, the less appropriateness of the DASS-21 as depression screener. Subsequently, a possible explanation for this could have been that individuals with lower IQ's misunderstand questions more easily, since they have limited linguistic and reading level, and difficulties with reading comprehension (Douma, 2018; Van der Nagel, Kiewiek, & Didden, 2017). Important to bear in mind is that it was decided to also include the two respondents that are not MBID, to be able to get somewhat more reliable test

results by increasing the sample size. These respondents have a low to average level of cognitive functioning (IQ 86-100). Suppose the DASS-21 is less appropriate for screening depression among individuals with lower IQ levels, including these two low to average intelligent participants could have slightly increased the correlation and thus, caused an overestimated validity. Yet, the sample was too small to assess moderation of IQ by use of the moderation analysis. Once data of more respondents is collected this analysis can still be executed by use of the syntax in Appendix C. Currently, no actual conclusions regarding moderation of IQ can be reached, because of absence of the moderator analysis. However, in the current study the correlation between the DASS-21 and the BDI-II appeared to be high. Since this suggests no third variable such as IQ moderates the correlation negatively, results of the DASS-21 seem not influenced by IQ. Assuming this conclusion to be true, it is rather recommended to implement future research to the appropriateness of using the DASS-21 among MBID by carrying out qualitative research. With qualitative research the user-friendliness and the suitability of the DASS-21 among individuals with MBID can be examined. For example, the three-step test-interview (TSTI) could be administered for testing the quality of the DASS-21 for the population with MBID. The TSTI is an observation-based procedure that can be used to identify response problems in self-report measures (Jansen & Hak, 2005). The procedure exists of three steps. Firstly, the respondent is asked to complete the questions of a self-report questionnaire while reading and thinking aloud. Secondly, the researcher conducts an interview to clarify actual observations during the first step, by asking the respondent about his/her interpretations and thoughts during completion of the questions. Thirdly, a debriefing interview is conducted to explore the reasons of why respondents had difficulties with answering particular questions (Jansen & Hak, 2005). This information can contribute to evaluating the usability of the DASS-21 among individuals with MBID and subsequently, to the decision-making of whether or not including the DASS-21 as depression screener in the MID-ROM that Tactus develops.

With respect to the reliability of this study, there is a possible negative effect regarding the time lag of four weeks between the measures of the DASS-21 and the BDI-II. This is a limitation of this study that might have reduced the reliability of the results. The time lag caused greater chance on variety in the scores on the DASS-21 and the BDI-II, possibly due to treatment effects or due to a naturally abated substance use induced depression. Since a substance use induced depression seems to abate after 2-3 weeks of abstinence (Schuckit, 2006), the possibility existed that depression would occur more often according to the DASS-

21 than according to the BDI-II, since the DASS-21 is measured after merely one week of abstinence and the BDI-II after five weeks of abstinence. In retrospect, a strong negative relationship between the DASS-21 and the BDI-II could appoint to the earlier existence of a substance induced depression. However, this result is not obtained. Yet, since the chance exists that substance use induced depression influences test results, for future use of the DASS-21 it seems more beneficial to screen depression after at least 2-3 weeks of abstinence. Possibly, this increases the chance to obtain a more reliable representation of symptoms of a depression. Another limitation of this study is that, according to Beurs et al. (2001), the test-retest reliability of the DASS-21 appeared to be questionable. This possibly also decrease the reliability of the found correlation between the DASS-21 and the BDI-II, since scores on the DASS-21 might vary over time. Lastly, some participants relapsed in substance use during their clinical treatment. This implies they did not comply with the five week period of abstinence, recommended by the Nederlandse Vereniging voor Psychiatrie (Dutch society for Psychiatry) for screening depression reliably (Nederlandse Vereniging voor Psychiatrie, 2009). However, since substance use induced depression seems to occur after prolonged substance abuse, it is assumed a singular relapse in substance use does not immediately induce a substance induced depression. Therefore, it is assumed that the two participants that relapsed did not influence the correlation between the DASS-21 and the BDI-II.

Besides the strength of the relationship with other depression screeners, the sensitivity and specificity of the DASS-21 are examined. The sensitivity and specificity appeared solely to be high for the indication of a severe depression. Since the relationship between the DASS-21 and the BDI-II is strong, it is suggested to utilize a lower cut-off score of the DASS-21 for indicating moderate depression. This study revealed that the sensitivity and specificity of the DASS-21 for indicating a moderate depression is 100% when utilizing a cut-off score of 15. In accordance with this result, it is suggested to utilize this cut-off score of 15 for indicating a moderate depression by use of the DASS-21.

Questionnaires that are measured simultaneously with the DASS-21 are the SDQ-18 and the Honos. Therefore, higher correlations were expected than between the DASS-21 and the BDI-II, between which there is a time lag of four weeks. However, this study shows non-significant correlations with the SDQ-18 and the Honos, with observed coefficients lower than the BDI-II. The SDQ-18 measures the existence of emotional problems by use of the 'emotional problems'-subscale that is used in this study. Emotional problems also occur in depression. Therefore, a certain degree of positive correlation between the DASS-21 and the

SDQ-18 was expected, what would add to the convergent validity of the DASS-21. The found moderately positive correlation between these questionnaires somewhat verifies the hypothesis that the DASS-21 is a solid depression screener. However, the found correlation appeared to be non-significant. Yet, the power of this analysis is low, since it appeared to be well below a power of 80% (Cohen, 1988). This might be caused by the small study sample. The low power implies that the non-significant result is very uncertain, what increases the likelihood of falsely rejecting this hypothesis. Therefore, it remains unsure whether or not the correlation between the DASS-21 and the SDQ-18 might add to the convergent validity of the DASS-21.

A similar result is found regarding the analysis of the DASS-21 and the Honos. A moderately positive correlation between these questionnaires is found. Thus, the Honos seems to add to the construct validity of the DASS-21 to some degree. However, also this result appeared to be non-significant. For screening depression with the Honos, informants need to estimate the degree of a possible existing depression by answering a single item. Mileviciute and Hartley (2013) stated that affective and cognitive symptoms of depression seem better reported in self-reported questionnaires than by informant measures. Therefore, it seems admissible that symptoms of depression are easily overlooked by use of the Honos, what can cause false estimations. This assumption seems likely, taking into account that a practitioner of the participant has to assess depression after the first week of treatment. Since practitioners are not yet quite familiar with the participant after one week, assessing depression might be difficult. As a result, depression is possibly not identified well. Given the non-significant correlation between the DASS-21 and the Honos, it seems admissible the moderate correlation is due to coincidence. However, the study sample is very small and the power appeared to be low. Therefore, the null-findings remain inconclusive and there seems an increased chance at falsely rejecting the hypothesis that a positive correlation between the DASS-21 and the Honos exist. Since the results of the analyses with the SDQ-18 and the Honos are rather tenuous, these questionnaires are not further analysed in favour of validating the DASS-21.

Final statement

Significant effects are found in this exploratory study, in favour of the validation of the DASS-21 among individuals with MBID and SUD/AD. However, some results reveal tenuous support for the validity of the DASS-21. Therefore, future confirmatory research is

necessary to be able to draw conclusions with greater certainty. Although, future confirmatory research is necessary to obtain more reliable test results, this study already produced some valuable findings. This emphasises the relevance of this study, since these findings enable to give suggestions for making some adjustments regarding utilising the DASS-21. The first suggestion is to postpone the first measuring moment of the DASS-21 to approximately the fifth week of treatment. This might produce more reliable depression measures, since substance use induced depression will be abated (Schuckit, 2006). Subsequently, participants of the future MID-ROM study will also be less burdened, since the pre-measure of the DASS-21 can then be eliminated. The second suggestion is to decrease the cut-off score of the DASS-21 to 15 to be able to screen for a moderate depression. With the currently used cut-off score of 21 symptoms of a moderate depression seem to be overlooked and it seems to solely indicate for severe depression. Thus, regarding the sensitivity and specificity of the DASS-21 for screening for symptoms of a moderate depression, adjusting its cut-off score would probably enhance its usability. The third and last implication is to conduct qualitative future research to examine the DASS-21 its user-friendliness among individuals who are MBID. This might reveal more information concerning the extent to which individuals with MBID will be burdened by use of the DASS-21. Subsequently, this information can reveal whether or not Tactus should maintain the DASS-21 as depression screener for their patient population with MBID and SUD/AD. In conclusion, this study seemed to reveal some first indications that the DASS-21 is a valid depression screener to use among individuals with MBID and SUD/AD. This is consistent with the purpose of this study, namely: making a first step towards validation of the DASS-21 among individuals with MBID, who have a SUD/AD.

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Appendix A

Table 1

Patient characteristics

Variables	
Participants, n	12
Gender	
Male, n (%)	11 (91,7)
Female, n (%)	1 (8,3)
Age, M (SD)	
Range (min-max)	22 – 53
Main substance(s) of use	
Cannabis, n (%)	3 (25,0%)
Cannabis + stimulantia, n (%)	2 (16,7)
Cannabis + alcohol, n (%)	1 (8,3%)
Alcohol, n (%)	4 (33,3%)
Stimulantia, n (%)	1 (8,3%)
Stimulantia + cocaine, n (%)	1 (8,3%)
IQ	
MID (50-70), n (%)	6 (50)
BIF (71-85), n (%)	3 (25)
Other (86-100), n (%)	2 (16,7)

Appendix B

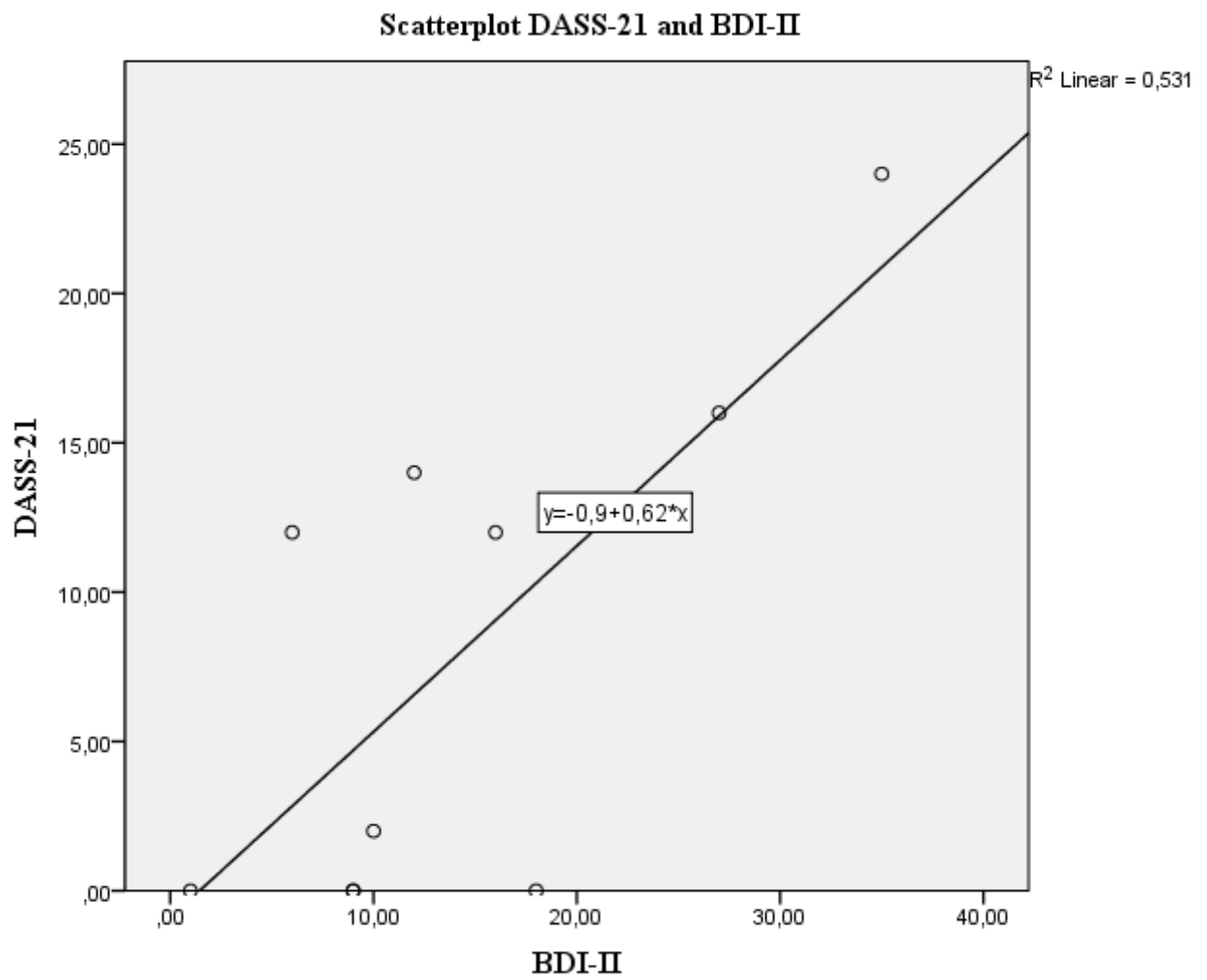


Figure 1. Scatterplot of the DASS-21 scores and the BDI-II scores

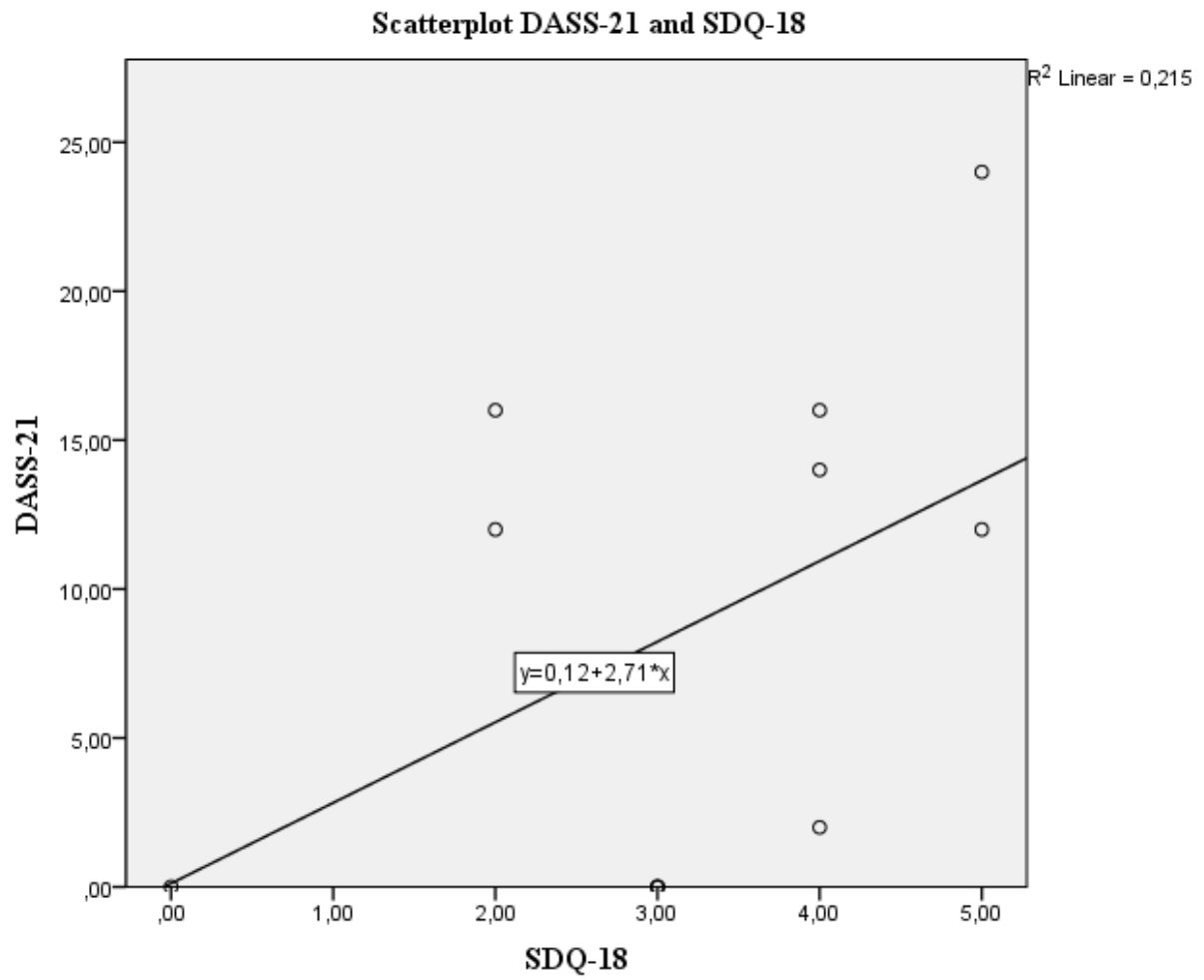


Figure 2. Scatterplot of the DASS-21 scores and the SDQ-18 scores

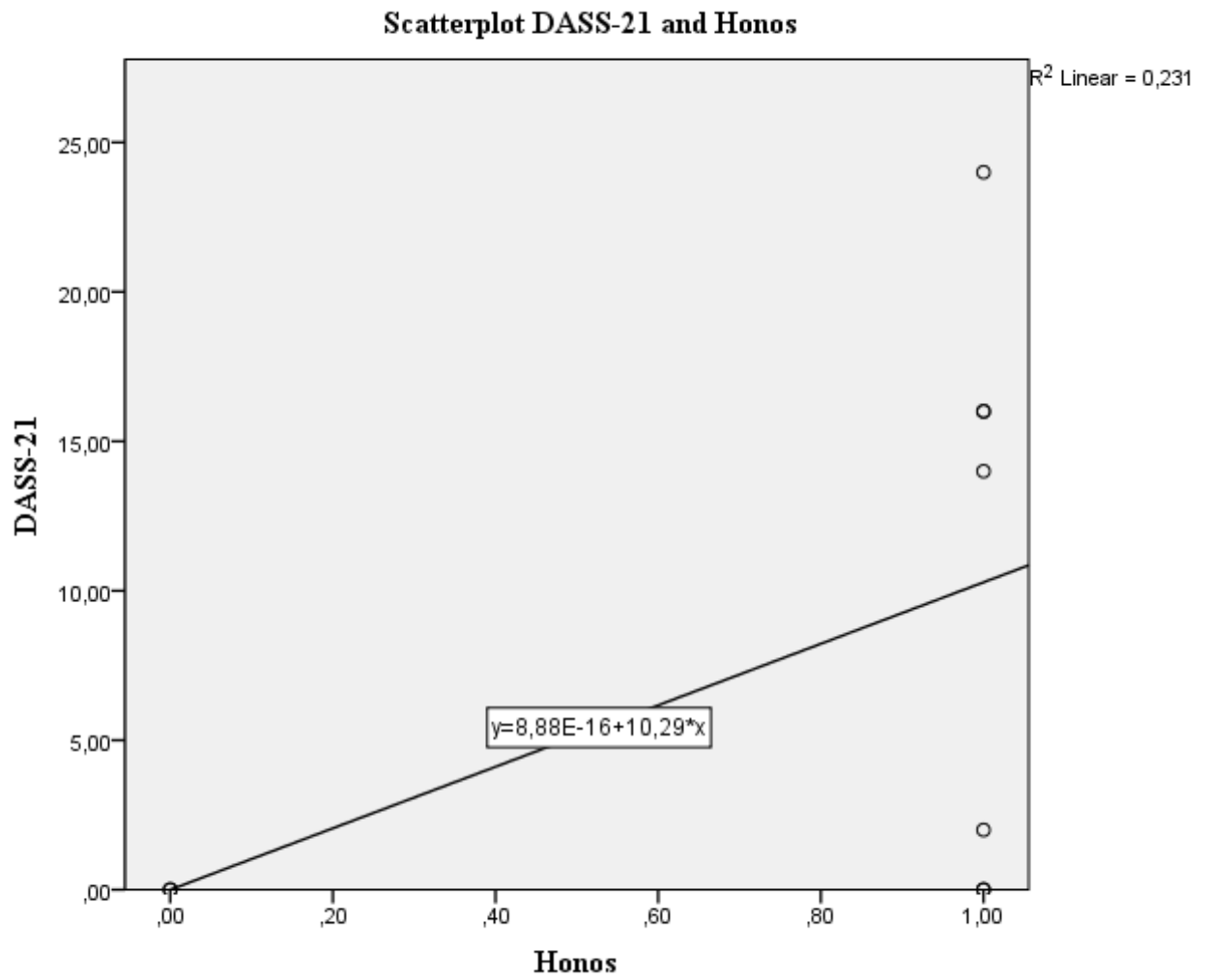


Figure 3. Scatterplot of the DASS-21 scores and the Honos scores

Appendix C: Syntax for executing a moderator analysis

```
COMPUTE BDI_centr=13.5455.
```

```
EXECUTE.
```

```
COMPUTE IQ_centr=69.8182.
```

```
EXECUTE.
```

```
COMPUTE BDI_IQ_centr=BDI_centr * IQ_centr.
```

```
EXECUTE.
```

```
REGRESSION
```

```
  /MISSING LISTWISE
```

```
  /STATISTICS COEFF OUTS CI(95) R ANOVA
```

```
  /CRITERIA=PIN(.05) POUT(.10)
```

```
  /NOORIGIN
```

```
  /DEPENDENT DASS_21
```

```
  /METHOD=ENTER BDI_centr IQ_centr IQ_BDI_interaction
```


Appendix D

Table 2

Crosstabulation of the cut-off scores of the DASS-21 with the BDI-II severe depression

		BDI-II-NL severe depression		
		depressed (>29)	non-depressed (<28)	Total
DASS21 depressed (>21)	Count	1	0	1
	% within DASS21	100,0%	0,0%	100,0%
non-depressed (<20)	Count	0	9	9
	% within DASS21	0,0%	100,0%	100,0%
Total	Count	1	9	10
	% within DASS21	10,0%	90,0%	100,0%

Table 3

Crosstabulation of the cut-off scores of the DASS-21 with the BDI-II moderate depression

		BDI-II-NL moderate depression		
		depressed (>20)	non-depressed (<19)	Total
DASS21 depressed (>21)	Count	1	0	1
	% within DASS21	100,0%	0,0%	100,0%
non-depressed (<20)	Count	1	8	9
	% within DASS21	11,1%	88,9%	100,0%
Total	Count	2	8	10
	% within DASS21	20,0%	80,0%	100,0%

Table 4*Crosstabulation of the cut-off scores of the DASS-21 with the BDI-II mild depression*

		BDI-II-NL mild depression		
		depressed (>14)	non-depressed (<13)	Total
DASS21 depressed (>21)	Count	1	0	1
	% within DASS21	100,0%	0,0%	100,0%
non-depressed (<20)	Count	3	6	9
	% within DASS21	33,3%	66,7%	100,0%
Total	Count	4	6	10
	% within DASS21	40,0%	60,0%	100,0%

Table 5*Crosstabulation of a DASS-21 cut-off score of 15 with the BDI-II moderate depression*

		BDI-II-NL moderate depression		
		depressed (>20)	non-depressed (<19)	Total
DASS21 depressed (>15)	Count	2	0	2
	% within DASS21	100,0%	0,0%	100,0%
non-depressed (<14)	Count	0	8	8
	% within DASS21	0,0%	100,0%	100,0%
Total	Count	2	8	10
	% within DASS21	20,0%	80,0%	100,0%