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Validity and psychometric properties of the Self-Identification as Having a Mental Illness Scale (SELF-I) among currently untreated persons with mental health problems

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Abstract (200 words)

Conceptualizing own symptoms as potential signs of a mental illness is an important, yet under-researched step towards appropriate help. Few validated measures address recognition and identification of own mental illness. Aim of this study is to investigate performance and correlates of the 'Self-Identification as Having a Mental Illness' scale (SELF-I) in a group of 229 currently untreated individuals with mental health problems, predominantly depression. Measures included: self-identification with having a mental illness (SELF-I), depressive and somatic symptom severity (PHQ-9 and PHQ-15), illness perceptions (B-IPQ-R-C), and sociodemographic variables. Principal-component analysis revealed in a unidimensional factor structure. The SELF-I showed good reliability in terms of internal consistency (Cronbach's alpha, 0.85-0.87) and re-test reliability over three months (Intraclass correlation coefficient, 0.74). Associations with depressive symptoms, previous treatment experiences and self-labelling demonstrated construct and criterion validity. Low associations with somatic symptoms and with illness-perceptions as measured by the B-IPQ-R-C indicated discriminant validity. We did not observe any floor or ceiling effects. The SELF-I scale is a brief, unidimensional and reliable measure of self-identification as having a mental illness that offers useful research perspectives.

Key words: self-identification, mental illness, stigma, psychometrics, scale

1. Introduction

A majority of individuals with mental illness do not seek professional help for their mental health problems, or only do so after considerable delay (Kohn et al., 2004). The literature highlights numerous reasons for this 'treatment gap' that can be broadly categorised into structural and attitudinal barriers (Andrade et al., 2014). While attitudinal barriers have been examined with regard to fear of stigmatization, experiences of stigma stress or negative treatment attitudes (Schibalski et al., 2017; Staiger et al., 2017), reluctance of individuals to consider themselves as having a mental health problem in the first place is a particularly hidden attitudinal barrier to seeking help (Schomerus et al., 2009). Awareness of mental health symptoms and relating them to a potential mental health problem is one of the first and crucial steps before individuals perceive a need for help or develop help-seeking intentions (Corrigan et al., 2014; Stolzenburg et al., 2017). Epidemiological data on self-diagnosis of mental disorders is sparse. In England, the Adult Psychiatric Morbidity Survey showed that about 80% of those with common mental disorders (CDM) indicated they ever had a CMD at some point, when presented with appropriate diagnostic labels, while this percentage was only about 40% in those with psychosis (NHS digital, 2014).

Drawing distinctions between "self" and symptoms is more difficult in mental compared to physical illness, making it harder for affected individuals to identify with having a mental illness (Moses, 2009). In different qualitative studies of individuals with depression, some concepts of mental health problems like interpreting several symptoms as an expression of problems of everyday life, self-perceptions (for instance being 'the strong one') or illness representations (like perceiving symptoms as temporary) were associated with not seeking professional help (Doblyte and Jimenez-Mejias, 2017; Savage et al., 2016). Integrating results from 20 qualitative studies, Doblyte and Jimenez-Mejias (2017) conclude that having a mental illness poses a threat to an

individual's identity (Peter et al., 2017), for example by being forced to admit having a mental health problem or by accepting a label, and that in order to seek help, such changes of identity are necessary. Assessing self-identification as having a mental illness is thus of particular importance in persons who show symptoms of mental illness, but have not yet sought help for their mental health problem.

Identification with a mental health problem is only partially represented in established models of health behavior. For example, both the Theory of Planned Behavior (TBP, Ajzen 1991) and the Common Sense Model of Self Regulation (CSM) (Leventhal et al., 1998) assume that a person is aware of his/her health problem when considering seeking help. In contrast, the Health Belief Model (HBM) includes perceived susceptibility to developing a health problem as a predictor of health behavior, which, in the case of mental illness, clearly is an important aspect of self-identification. Identifying with having a mental illness can also be considered within the scope of self-rated health. It has been suggested that "self-rated health is not only a spontaneous assessment of changes in observable health status or health determinants, but also a reflection of an enduring self-concept" (p. 213; Bailis et al., 2003). Accordingly, we define self-identification as having a mental illness as a dynamic cognitive process that consists of both the spontaneous assessments of current health complaints and the awareness of personal vulnerability to mental illness. We consider self-identification thus as a process best elicited by a continuous (rather than categorical) measure. Schomerus and colleagues (2012) developed such a brief five-item scale, originally termed "Mental Health Problem Appraisal Scale" and later re-named Self-Identification as Having a Mental Illness Scale (SELF-I). Items cover both current assessment of one's own mental health and general susceptibility to developing a mental health problem. This scale was piloted in a small community sample of persons with currently untreated mental health problems, showing excellent internal consistency (Schomerus et al., 2012).

The aim of the study at hand is to investigate factor structure and psychometric properties of the SELF-I in a larger sample. Following the criteria proposed by Terwee and co-workers (2007), we examine presence of floor/ceiling effects, internal consistency, reproducibility, criterion validity and construct validity, when using the SELF-I in currently untreated individuals with mental health problems, predominantly depression. To test criterion validity, we elicited past experience of mental health treatment and naming a mental illness as the cause of the present problems. To examine construct validity, we investigated whether the SELF-I was associated with more symptoms of depression, as well as with lower severity of somatic symptoms (discriminant validity). Moreover, we exploratively investigate associations of the SELF-I with different domains of illness perceptions according to the Common Sense Model of Self Regulation (CSM) (Leventhal et al., 1998). The CSM postulates that an individual's response to an illness is guided by representations of perceived consequences of his/her illness, the expected timeline of the illness, personal control, treatment control, identity (which refers to perceptions of symptoms related to an illness), concern, understanding and emotional response related to the disorder. Adding to the discriminant validity of our measure, we expect only low positive correlations with the domains oft the CSM, since they are concerned with illness perceptions, but not with considerations whether one has an illness or not, thus having only a small conceptual overlap with self-identification.

2. Methods

2.1. Study design and sample

Details about our sampling method have been described in more detail elsewhere (e.g. Schomerus et al., 2018; Stolzenburg et al., 2017). Briefly, in order to recruit a community sample of currently untreated individuals with mental health problems, we used newspaper advertisements, social media posts and flyers in which we described several symptoms of depression without the

use of psychiatric wording or terminology, and invited those who had similar symptoms to call our study center (Stolzenburg et al., 2017). After telephone screening, we included 266 participants having at least mild to moderate symptoms of depression (PHQ-9 $\geq$ 8), who stated that they were not receiving professional treatment at the time, and invited them to a personal interview. 233 persons completed the interview (n = 31 did not attend, n = 2 terminated the interview early). Four participants who stated during the interview that they were presently in treatment were excluded from our final analyses. Our resulting final sample consisted of n = 229 participants (baseline) with currently untreated depressive symptoms. Three and six months after baseline (follow-up 1 and 2) we conducted telephone interviews using the SELF-I scale. In total, 199 of 229 participants (86.9%) completed follow-up 1, 172 (75.1%) completed follow-up 2. Altogether, 163 (71.2%) completed both follow-up interviews.

2.2.Measures

The interview consisted of a self-report questionnaire and a diagnostic interview (M.I.N.I.; Ackenheil et al., 1999) conducted by three psychologists who trained as psychotherapists, had worked in both in- and outpatient services, and were experienced in administering structured diagnostic interviews. Prior to the study, they received a joint training for administering the M.I.N.I.. Information about socio-demographic characteristics and previous treatment were elicited at the beginning of the self-report questionnaire.

We used the five original items from Schomerus and colleagues (2012) to assess *self-identification as having a mental illness*, altogether forming the SELF-I scale. The original German version of the items is available in the online supplement, Table 1 shows their English translation, which was conducted involving back-translation and discussion/resolution of any differences between versions (Sartorius et al., 1994). Participants rated each item on a 5-point

Likert scale anchored with "1 = don't agree at all" and "5 = agree completely". Items 2, 4 and 5 are inverted and need to be reversed before scoring the scale. Higher scores indicate higher self-identification with having a mental illness.

Criterion validity: To assess previous treatment experience we used one question ("Have you ever sought professional help for a mental health problem?") and defined a dummy variable with 1 indicating that participants reported previous treatment experience. Furthermore, we assessed whether participants considered their own complaints being related to a disease in general ("My complaints are part of an illness"). This single item was answered on a 5-point Likert scale anchored with "1 = not at all", "2 = rather no", "3 = don't know", "4 = rather yes" and "5 = definitely". Participants stating that their complaints were "rather yes" or "definitely" part of an illness were subsequently asked to name a disease which described their symptoms best. From this open-ended question, we defined a dummy variable with 1 indicating that participants had named any mental illness as a cause for their symptoms and used this variable *self-labeling* for our analyses.

Construct validity: The German version of the Patient Health Questionnaire (PHQ-D; Gräfe et al., 2004; Kroenke et al., 2010) was applied to assess self-reported *symptoms of depression* (PHQ-9). The PHQ-9 is an established nine-item screening instrument based on DSM-IV and DSM-5 criteria for major depression with established criterion validity and excellent reliability (Cronbachs alpha 0.86-0.86, Kroenke et al., 2010). Symptoms of depression are rated on a 4-point Likert scale to indicate whether they had occurred "0 = not at all" to "4 = nearly every day" within the past two weeks. Example items from the PHQ-9 are: "little interest or pleasure in doing things", "trouble concentrating on things, such as reading the newspaper or watching television" and "feeling down, depressed or hopeless". To assess self-reported *somatic*

symptoms, we used the somatic symptom severity subscale of the PHQ-D, the PHQ Physical Symptoms (PHQ-15), which has also been shown to be valid and reliable (Cronbachs alpha 0.80, Kroenke et al., 2010). Its items enquire how much participants had been bothered by symptoms like "stomach pain", "back pain", "shortness of breath" in the last four weeks using a 3-point Likert scale ranging from "0 = not at all" to "2 = bothered a lot". We excluded the items "feeling tired or having low energy" and "trouble sleeping", since they overlap with identically worded depressive symptoms elicited with the PHQ-9.

We used eight items of the brief version of the *Illness Perception Questionnaire* (B-IPQ; Broadbent et al., 2006), with each item representing one domain of its "parent measure" IPQ-R, the original long form of the IPQ instruments family: perceived consequences of one's own illness, expected timeline, personal control, treatment control, identity, concern, understanding and emotional response regarding the illness. Since we were investigating individuals with mental health problems who were not in treatment at the time and who may not be aware of their mental health problem, we altered the term "your illness" to "your complaints" and changed item 5 ('identity') from "How much do you experience symptoms from your illness?" to: "How much do you experience any effects from your complaints?". We called this version "Brief Illness Perception Questionnaire – Revised – Complaints" (B-IPQ-R-C; Muehlan et al., in preparation). All items were rated on a response scale of 0 to 10.

2.3. Statistical analyses

When computing total scores for the SELF-I, PHQ-9 and PHQ-15, we imputed missing values using the individual mean participant response of the respective scale if no more than 25% of values were missing (Downey and King, 1998; Roth et al., 1999). Imputation was necessary for

2-28 participants per scale (1.0-12.2%) at baseline (n = 229). No imputation was necessary for follow-ups.

First, we calculated descriptive statistics for the SELF-I, including examination of any floor/ceiling effects. Second, we performed principal-component analysis (PCA) with varimax rotation to examine the scale factor structure. To inspect for potential reproducibility of the identified factor structure at baseline, we repeated the EFA at each follow-up. A true confirmation of the factor structure by means of CFA was not applicable given the dependent nature of the data at each point of assessment. Third, Cronbach's alpha was calculated for baseline, follow-up 1 and 2. Fourth, we examined test-retest-reliability by calculating intraclass correlation coefficients (ICC, individual coefficient) and their 95% confidence intervals based on consistency of agreement, a two-way mixed-effects model, jointly considered for follow-up 1 and 2, which were both conducted by telephone). Fifth, we used Kruskal-Wallis-Tests and Cohen's *d* for group comparisons of the total item-mean scores of the SELF-I with regard to previous treatment experience (yes, no) and self-labeling (yes, no) as indicators of criterion validity of the SELF-I. Sixth, we calculated bivariate correlation analyses (Spearman's rank correlation coefficients) to calculate the strength of associations between the SELF-I and severity of depression symptoms (PHQ-9 convergent validity), severity of somatization symptoms (PHQ-15, discriminant validity) and different illness perceptions (B-IPQ-R-C, divergent validity). All statistical procedures were computed using Stata (version 14).

3. Results

3.1. Sample characteristics

The majority of participants at baseline were female (69.9%), with an average age of 50.4 years (*SD* = 16.3). Comparing the participants' level of education to statistical data for the local population (Statistical Office Germany, 2015) showed that participants had slightly higher levels of education than the general public: 34.1% had completed 12 or 13 years of schooling (local general population: 20.3%), 57.4% had completed 10 years of schooling (local general population: 53.3%) and only 8.5% had completed 9 years of schooling or less (local general population: 19.7%).

For the whole sample (baseline), the severity of depression symptoms (PHQ-9; *M(SD)* = 12.2(4.8), range 2-27) corresponded to a moderate depression. 68.9% (n=153) scored 10 or higher on the PHQ-9, compared to 8.1% in a general population sample in Germany (Busch et al., 2013). Somatic symptom levels (PHQ-15; *M(SD)* = 13.5(4.9), range 2-26) were mild to moderate (Kroenke et al., 2010). About 90% (*n* = 207) of participants met diagnostic criteria for at least one mental illness according to ICD-10 within the diagnostic interview (M.I.N.I.). A majority of these fulfilled diagnostic criteria for an affective disorder (F3: *n* = 181, 87.4%) or for a neurotic, stress-related or somatoform disorder (F4: *n* = 120, 58.0%). 47.3 % (*n* = 98) of participants simultaneously met criteria for both F3 and an F4 disorders. One in two (50.7%) reported that they had previously been in treatment for a mental health problem and one in four participants (22.7%) named a mental illness describing their current complaints best (self-labeling).

3.2. Descriptive statistics for SELF-I

Participants in our study had a mean item score of 3.0 (*SD* = 1.0, range 1-5) and an average total scale summary score of 15.1 (*SD* = 5.0, range 5-25). 9 participants (3.9%) scored 5, 5 participants (2.2%) scored 25 on the SELF-I, showing no floor or ceiling effect of our measure. Distribution

analyses showed a symmetric distribution (skewness of -0.00), while kurtosis was 2.30, suggesting that the central peak was lower and broader than a normal distribution.

3.3. Factor structure, internal consistency and test-retest reliability

Bartlett's Test of Sphericity ($p \leq 0.001$) indicated that the data were suitable for factor analysis (Williams et al., 2010). The overall Kaiser-Meyer-Olkin measure of sampling adequacy was 0.808, indicating adequate sampling (Beavers et al., 2013). After principal component factor analysis with varimax rotation, scree plot estimation suggested one underlying factor (eigenvalue 3.15). No other factors produced eigenvalues greater than 1.0. Rotated factor loadings of all SELF-I items varied between 0.66 and 0.88 (Table 1), indicating all five items being associated with the factor. Calculating the same factor analysis for both follow-ups corroborated this one-factor structure, showing eigenvalues of 3.40 and 3.37. *Internal consistency* of the SELF-I was good at baseline (Cronbach's alpha, 0.85) and both follow-ups (0.87). Item-test and item-rest correlation coefficients of each item (at baseline) are presented in Table 1. We calculated ICCs for *test-retest reliability* (Table 1). ICC was 0.74 (95%-CI [0.67, 0.81], $p \leq .001$) for T1-T2. Item 2 exhibited the smallest, item 3 the highest ICC.

##Table 1##

Inter-item correlation coefficients of the SELF-I scale at baseline (Table 2) show that all items were significantly associated with each other. Items 2 and 3 had the lowest correlation (r = 0.32), while the highest correlation was between items 4 and 5 (r = 0.73).

##Table 2##

3.4. Criterion validity

We used group comparisons (Kruskal-Wallis-Test) of total item-mean scores of the SELF-I with regard to previous treatment experience and self-labelling at baseline as further indicators for criterion or known-groups validity. Individuals with treatment experience were more likely to identify with having a mental illness compared to individuals without treatment experience. Similarly, individuals labelling their complaints as a mental illness reported higher scores on the SELF-I (Table 3).

##Table 3##

3.5 *Construct validity*

We used Spearman's rank correlation coefficients to examine convergent validity (depressive symptoms, PHQ-9) and divergent validity (somatic symptoms, PHQ-15, Table 4). The SELF-I was associated with severity of depression symptoms ($r_{(214)} = 0.43$), while association with somatic symptoms was lower ($r_{(214)} = 0.26$). As a sensitivity analysis, we simultaneously entered somatic and depression symptoms into a linear regression model with SELF-I scores as dependent variable. Here, the association with depression symptoms persisted ($\beta = 0.47$, $p < 0.001$), while the association with somatic symptoms disappeared ($\beta = -0.03$, $p = 0.690$; adj. $R^2 = 0.19$). With regard to illness perceptions (B-IPQ-R-C), the SELF-I showed a moderate correlation with stronger emotional impairment and was weakly associated with more perceived consequences for life, longer perceived duration of current complaints, less perceived personal control of the problem, more identity with and concern about the complaints. as well as stronger emotional impairment, while being unrelated to perceived treatment control and understanding of the complaints.

##Table 4##

4. Discussion

Our aim was to investigate the validity and psychometric performance of the SELF-I in a group of presently untreated individuals with mental health problems. Our study results indicate that the SELF-I has adequate reliability and is unidimensional, suggesting that it is measuring a single construct. Participants with more depressive symptoms, previous treatment experience and self-labelling as having a mental illness reported stronger self-identification, indicating good convergent and known-groups validity of the SELF-I. The association between SELF-I and symptoms of somatization was considerably weaker and disappeared when including both depression and somatization symptoms as predictors, indicating discriminant validity. Indicating divergent validity, illness perceptions like more perceived consequences for life or longer perceived duration of current complaints showed low to moderate associations with the SELF-I. Indirectly, this also informs us on the representation of mental illness in the community, which seemingly is unrelated to perceived treatment control and understanding of symptoms.

At this point, some limitations of our study need to be addressed. First, our sample was restricted to persons with currently untreated mental health problems (predominantly depression), which constitute an important group for mental health service research that is difficult to access. We do not know, however, how the SELF-I performs in the general population or in persons with physical complaints only. Second, during the three-month interval to determine retest reliability symptom severity might have changed. A smaller time period between measurements might result in a better retest reliability.

On a conceptual level, the SELF-I needs to be distinguished from measures of other, related constructs. Measures of group identity that are usually based on items by Leach and colleagues (2008), are more closely related to identity theory and refer to a rather firm status of

either being in- or outside the group of persons with, for example, depression (Cruwys and Gunaseelan, 2016). In the context of mental illness, they do not account for perceived vulnerability or susceptibility to mental health problems. Another construct that is related to self-identification is insight. This construct has been measured primarily in persons with psychotic disorders, where 'lack of insight' is often considered a symptom of the illness. Recently, the construct of insight has been criticized for carrying strong normative connotations, suggesting the existence of a 'right' way of acknowledging personal mental illness (Chio et al., 2018; Lien et al., 2018).

Examining self-identification as having a mental illness could aid our understanding of both help-seeking and recovery (Wisdom et al., 2008). As outlined in the introduction, self-identification seems particularly relevant for help-seeking for mental disorders (Zimber et al., 2018), and is not well represented in general help-seeking theories such as the TPB, CSM or HBM. A longitudinal analysis of the present data showed that self-identification was strongly related to perceived need, which in turn was related to help-seeking intentions, which predicted help-seeking over six months, all contributing to a significant indirect effect of self-identification on help-seeking (Schomerus et al., 2018). Self-identification thus seems to be an important addition to established theories of help-seeking for mental disorders.

However, self-identification could also have negative consequences. Identifying with having a mental illness could trigger self-stigma, as conceptualized in the progressive model of self-stigma (Corrigan et al. 2011; Schenner et al., 2018). There is also growing evidence that an identity as having a mental illness is associated with stronger stigma experiences (Cruwys and Gunaseelan, 2016) and may thus hinder recovery (Yanos et al., 2010). It is thus a challenge to psychiatry and future research to find ways to acknowledge personal mental health problems without unwanted negative effects like submitting to harmful stereotypes and self-stigma.

Probably, promulgating a continuum model of mental illness (Corrigan et al., 2017; Schomerus et al., 2016), which is associated with less stigmatizing attitudes, might enable individuals to rate their current mental health as "more" or "less" rather than as "yes" or "no" within a dichotomous model. The continuous nature of the SELF-I could be valuable for appropriate research of these questions. Future research using the SELF-I should also follow up findings of the 2014 Adult Psychiatric Morbidity Survey (NHS digital, 2014), indicating that self-identification as having a mental illness differs among different mental illnesses like psychotic disorders and common mental disorders like depression. Such information would be helpful for understanding different pathways in seeking professional help for different mental disorders.

In summary, the SELF-I is a brief, valid instrument with good psychometric properties that can be used in samples of persons with potentially undiagnosed mental disorders to measure the extent to which participants consider themselves as having a mental illness.

Conflicts of interest: none.

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References

Ackenheil, M., Stotz-Ingenlath, G., Dietz-Bauer, R., Vossen, A., 1999. MINI Mini International Neuropsychiatric Interview, German Version 5.0. 0 DSM IV. Psychiatrische Universitätsklinik München, Germany.

Ajzen, I. (1991) The Theory of Planned Behavior. Organ Behav Hum Decis Process 50, 179-211.

Andrade, L.H., Alonso, J., Mneimneh, Z., Wells, J.E., Al-Hamzawi, A., Borges, G., et al., 2014. Barriers to mental health treatment: results from the WHO World Mental Health surveys. Psychol Med 44 (6), 1303-1317.

Bailis, D.S., Segall, A., Chipperfield, J.G., 2003. Two views of self-rated general health status. Soc Sci Med 56 (2), 203-217.

Beavers, A.S., Lounsbury, J.W., Richards, J.K., Huck, S.W., Skolits, G.J., Esquivel, S.L., 2013. Practical considerations for using exploratory factor analysis in educational research. Pract assess, res eval 18 (6), 1-13.

Broadbent, E., Petrie, K.J., Main, J., Weinman, J., 2006. The brief illness perception questionnaire. J Psychosom Res 60 (6), 631-637.

Chio, F.H.N., Mak, W.W.S., Chan, R.C.H., Tong, A.C.Y., 2018. Unraveling the insight paradox: One-year longitudinal study on the relationships between insight, self-stigma, and life satisfaction among people with Schizophrenia Spectrum Disorders. Schizophr Res.

Corrigan, P.W., Druss, B.G., Perlick, D.A., 2014. The impact of Mental Illness Stigma on seeking and participating in mental health care. Psychol Sci Public Interest 15 (2), 37-70.

Corrigan, P.W., Schmidt, A., Bink, A.B., Nieweglowski, K., Al-Khouja, M.A., Qin, S., et al.,2017. Changing public stigma with continuum beliefs. J Ment Health 26 (5), 411-418.

Cruwys, T., Gunaseelan, S., 2016. "Depression is who I am": Mental illness identity, stigma and wellbeing. J Affect Disord 189, 36-42.

Doblyte, S., Jimenez-Mejias, E., 2017. Understanding help-seeking behavior in Depression: A qualitative synthesis of patients' experiences. Qual Health Res 27 (1), 100-113.

Downey, R.G., King, C., 1998. Missing data in Likert ratings: A comparison of replacement methods. J Gen Psychol 125 (2), 175-191.

Eisenberg, D., Downs, M.F., Golberstein, E., Zivin, K., 2009. Stigma and help seeking for mental health among college students. Med Care Res Rev 66 (5), 522-541.

Gräfe, K., Zipfel, S., Herzog, W., Löwe, B., 2004. Screening psychischer Störungen mit dem "Gesundheitsfragebogen für Patienten (PHQ-D)". Diagnostica 50 (4), 171-181.

Kohn, R., Saxena, S., Levav, I., Saraceno, B., 2004. The treatment gap in mental health care. Bull World Health Organ 82 (11), 858-866.

Kroenke, K., Spitzer, R.L., Williams, J.B., Lowe, B., 2010. The Patient Health Questionnaire Somatic, Anxiety, and Depressive Symptom Scales: a systematic review. Gen Hosp Psychiatry 32 (4), 345-359.

Leach, C.W., Van Zomeren, M., Zebel, S., Vliek, M.L.W., Pennekamp, S.F., Doosje, B., et al., 2008. Group-level self-definition and self-investment: a hierarchical (multicomponent) model of in-group identification. J Pers Soc Psychol 95 (1), 144.

Leventhal, H., Leventhal, E.A., Contrada, R.J., 1998. Self-regulation, health, and behavior: A perceptual-cognitive approach. Psychol Health 13 (4), 717-733.

Lien, Y.J., Chang, H.A., Kao, Y.C., Tzeng, N.S., Lu, C.W., Loh, C.H., 2018. Insight, self-stigma and psychosocial outcomes in Schizophrenia: a structural equation modelling approach. Epidemiol Psychiatr Sci 27 (2), 176-185.

Moses, T., 2009. Self-labeling and its effects among adolescents diagnosed with mental disorders. Soc Sci Med 68 (3), 570-578.

Muehlan, H., Stolzenburg, S., Tomczyk, S., Freitag, S., Kendziora, M., Schmidt, S., et al., in prep. Development and validation of a complaints-version of the revised Illness Perception Questionnaire.

NHS digital, 2014. Adult Psychiatric Morbidity Survey: Survey of mental health and wellbeing, England, 2014. https://digital.nhs.uk/data-and-information/publications/statistical/adult-psychiatric-morbidity-survey/adult-psychiatric-morbidity-survey-survey-of-mental-health-and-wellbeing-england-2014 (accessed Dec. 17, 2018).

Peter, O., Lang, J., Stein, K., Wirth, K., Jungbauer, J., 2017. ["The Diagnosis is not me - But it is a part of me" - An in-depth interview study on perspectives of mentally ill people]. Psychiatr Prax. DOI: 10.1055/s-0043-100026

Roth, P.L., Switzer, F.S., Switzer, D.M., 1999. Missing data in multiple item scales: A monte carlo analysis of missing data techniques. Organ Res Meth 2 (3), 211-232.

Savage, H., Murray, J., Hatch, S.L., Hotopf, M., Evans-Lacko, S., Brown, J.S., 2016. Exploring professional help-seeking for mental disorders. Qual Health Res 26 (12), 1662-1673.

Sartorius, N., Kuyken, W. Orley, J., 1994 Translation of health status instruments. In Quality of life assessment: International perspectives, pp. 2-8. Berlin: Springer.

Schibalski J., Müller M., Ajdacic-Gross V., Vetter S., Rodgers S., Oexle N., et al., 2017. Stigma-related stress, shame and avoidant coping reactions among members of the general population with elevated symptom levels. Comprehensive Psychiatry 74, 224-230.

Schomerus, G., Angermeyer, M.C., Baumeister, S.E., Stolzenburg, S., Link, B.G., Phelan, J.C., 2016. An online intervention using information on the mental health-mental illness continuum to reduce stigma. Eur Psychiatry 32, 21-27.

Schomerus, G., Auer, C., Rhode, D., Luppa, M., Freyberger, H.J., Schmidt, S., 2012. Personal stigma, problem appraisal and perceived need for professional help in currently untreated depressed persons. J Affect Disord 139 (1), 94-97.

Schomerus, G., Matschinger, H., Angermeyer, M.C., 2009. The stigma of psychiatric treatment and help-seeking intentions for depression. Eur Arch Psychiatry Clin Neurosci 259, 298-306.

Schomerus, G., Stolzenburg, S., Freitag, S., Speerforck, S., Janowitz, D., Evans-Lacko, S., et al., 2018. Stigma as a barrier to recognizing personal mental illness and seeking help: a prospective study among untreated persons with mental illness. Eur Arch Psychiatry Clin Neurosci (online ahead of print).

Schenner, M., Kolbauer, D., Meise, U., Haller, C., Pixner-Huber, M., Stürz, K., Günther., V. 2018. “StigMa” — Evaluation of a psychological therapy program for stigma-management. Psychatr Prax 45 (1), 16-22.

Staiger ,T., Waldmann, T., Rüsch, N., Krumm, S., 2017. Barriers and facilitators of help-seeking among unemployed persons with mental health problems: a qualitative study. BMC health services research 17, 39.

Statistical Office Germany, 2015. https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/Bildungsstand/Tabellen/Bildungsabschluss.html. Accessed 23 Jan 2017

Stolzenburg, S., Freitag, S., Evans-Lacko, S., Muehlan, H., Schmidt, S., Schomerus, G., 2017. The stigma of mental illness as a barrier to self-labeling as having a mental illness J Nerv Ment Dis 205, 903-909.

Williams, B., Onsman, A., Brown, T., 2010. Exploratory factor analysis: A five-step guide for novices. Journal of Emergency Primary Health Care 8 (3), 1-13.

Wisdom, J.P., Bruce, K., Auzeen Saedi, G., Weis, T., Green, C.A., 2008. 'Stealing me from myself': Identity and recovery in personal accounts of mental illness. Aust N Z J Psychiatry 42 (6), 489-495.

Yanos, P.T., Roe, D., Lysaker, P.H., 2010. The impact of illness identity on recovery from severe mental illness. Am J Psychiatr Rehabil 13 (2), 73-93.

Zimber, A., Hentrich, S., Meyer-Lindenberg A., 2018. [Mental health risks among managers — results of a qualitative study and implications for stress prevention]. Psychiat Prax 45(1), 30-37.

Table 1:
Item characteristics for the SELF-I (n = 224-226) and intraclass correlation (ICC) coefficients (n = 160-163) over follow-up 1 and follow-up 2 (T1-T2).

	Items	*M (SD)*	Item-test correlation	Item-rest correlation	Factor loadings[a]	ICC
						T1-T2
1	Current issues I am facing could be the first signs of a mental illness.	3.0 (1.3)	0.80	0.67	0.80	0.57
2	The thought of myself having a mental illness seems doubtful to me. (R)	3.3 (1.3)	0.69	0.52	0.66	0.53
3	I could be the type of person that is likely to have a mental illness.	2.8 (1.3)	0.77	0.63	0.77	0.69
4	I see myself as a person that is mentally healthy and emotionally stable. (R)	3.0 (1.2)	0.82	0.71	0.84	0.59
5	I am mentally stable, I do not have a mental health problem. (R)	3.1 (1.3)	0.87	0.78	0.88	0.58
	Total	3.0 (1.0)				0.74

Note. M = mean; *SD* = standard deviation
(R) Inverse items, recoded. [a] rotated factor loadings (pattern matrix) of exploratory factor analysis

Table 2:
SELF-I intra-item correlation coefficients (Spearman's rank correlation; *n* = 224)

	SELF-I 1	SELF-I 2	SELF-I 3	SELF-I 4	SELF-I 5
SELF-I 1	-				
SELF-I 2	0.41***	-			
SELF-I 3	0.62***	0.32***	-		
SELF-I 4	0.56***	0.42***	0.57***	-	
SELF-I 5	0.61***	0.56***	0.55***	0.73***	-

Note. SELF-I = Self-Identification as Having a Mental Illness Scale;
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3:
Criterion validity: Comparisons of SELF-I scores with regard to previous treatment experience and self-labeling (*n*=229).

		N (%)	*M (SD)*	Statistical Difference	Effect Size (d)
Previous treatment experience	Yes	112 (50.7)	3.4 (1.0)	**χ^2 = 35.169, p < 0.001**	0.88
	No	109 (49.3)	2.6 (0.8)		
Self-Labeling	Yes	52 (22.7)	4.0 (0.8)	**χ^2 = 56.682, p < 0.001**	1.48
	No	177 (77.3)	2.7 (0.9)		

Note. *M* = mean; SD = standard deviation; Kruskal-Wallis-Test; significant results are in boldface. Interpretation of effect size *d* (= Cohen's *d*): 0.20: small; 0.50: medium; 0.80: large (Cohen, 1992).

Table 4:

Construct validity: Pairwise correlation coefficients (Spearman; n = 214-224) of SELF-I and severity of depression symptoms (PHQ-9), somatization symptoms (PHQ-15) and illness perceptions (B-IPQ-R-C).

	SELF-I
PHQ-9	0.44***
PHQ-15	0.26***
B-IPQ-R-C	
Consequences	0.25***
Timeline	0.15*
Personal control	0.18**
Treatment control	-0.06
Identity	0.18**
Concern	0.16*
Understanding	0.04
Emotional response	0.40***

Note. SELF-I = Self-Identification as Having a Mental Illness Scale; PHQ-9 = Patient Health Questionnaire (subscale depression); PHQ-15 = Patient Health Questionnaire (subscale somatic symptoms); B-IPQ-R-C = Brief Illness Perception Questionnaire - Revised - Complaints

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Online Supplement

Original German version of the SELF-I

Items:

1. Meine aktuellen Beschwerden könnten erste Anzeichen einer psychischen Erkrankung sein.
2. Die Vorstellung, selbst eine psychische Erkrankung zu haben, erscheint mir abwegig.*
3. Ich bin die Sorte von Person, die zu psychischen Krankheiten neigen könnte.
4. Ich sehe mich als Person, die geistig gesund und psychisch stabil ist.*
5. Ich bin mental stabil, eine psychische Erkrankung habe ich nicht.*

* Items are inverse

5-point Likert scale anchored with:

1 = Stimmt überhaupt nicht, 2 = Stimmt nicht, 3 = Weder noch, 4 = Stimmt, 5 = Stimmt voll und ganz