



## Distinctiveness and overlap of depersonalization with anxiety and depression in a community sample: Results from the Gutenberg Heart Study

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### ABSTRACT

Depersonalization disorder is considered to be a common clinical phenomenon and disorder with an enormous gap between prevalence and detection partly due to the common interpretation of depersonalization (DP) being a negligible variant of anxiety and depression. Therefore, we sought to analyze (1) the prevalence rate of DP in a large community sample ( $n = 5000$ ) according to a recently developed ultra brief two-item depersonalization screener; (2) the associations with depression, anxiety, physical and mental health status; and (3) whether DP contributes independently to the health status beyond anxiety and depression. The prevalence of clinically significant DP was 0.8% ( $n = 41$ ), and 8.5% ( $n = 427$ ) endorsed at least one symptom of DP. DP was independently associated with impairment of mental and physical health status as well as with a medical history of any depressive or anxiety disorder. Despite the consistent association of DP with anxiety and depression, the shared variances were small, and DP was clearly separated from symptoms of anxiety and depression in the principal component analysis. Therefore, we conclude that the implementation of depersonalization screening might be recommended.

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### 1. Introduction

After anxiety and depression, depersonalization has been considered to be the third most frequent symptom among psychiatric patients (Stewart, 1964). But although depersonalization (DP) is assessed routinely as part of the mental state examination in psychiatric and psychotherapeutic treatment, it is both underdetected and underdiagnosed (Simeon, 2004; Michal and Beutel, 2009; Sierra, 2009; Stein and Simeon, 2009). According to a recent evaluation of health insurance data of 1.5 million persons, the 1-year prevalence of the diagnosis of the depersonalization–derealization syndrome was only 0.007% (Michal et al., 2010a, 2010b, 2010c). This prevalence contrasts sharply with epidemiological studies reporting rates of 0.8–2% for clinically significant DP in the general population (Hunter et al., 2004; Michal et al., 2009). Reluctance of patients to report spontaneously about DP is one factor; another factor is the health care providers' relative lack of awareness, due to the common interpretation of DP as a negligible variant of anxiety and

depression (Simeon, 2004; Sierra, 2009). This neglect of DP however, may also have an impact on the treatment and outcome of depression and anxiety disorders. Several studies found that DP co-occurring with depression and anxiety is an index of disease severity, chronicity and poor treatment response (Katerndahl, 2000; Mula et al., 2007). Recently, we have shown in a large community sample that depersonalization severity was independently associated with suicidal ideation beyond depression and anxiety (Michal et al., 2010b).

In order to overcome the lack of awareness for DP, questionnaires or structured interviews are extremely helpful (Edwards and Angus, 1972). For clinical and neurobiological research purposes, Sierra and Berrios (2000) developed the Cambridge Depersonalization Scale (CDS), measuring the complex phenomenology of depersonalization and derealization experiences comprehensively with 29 items (Sierra and Berrios, 2000). This scale is currently the most detailed and valid measure describing and quantifying depersonalization and derealization, but the CDS seems too costly for routine screening purposes. Therefore an ultra-brief two-item scale for DP was developed from the CDS, i.e., the two-item version of the Cambridge Depersonalization Scale (CDS-2, Michal et al., 2010c). The scoring format of the CDS-2 was adopted from the most common ultra-brief screeners for depression and anxiety (PHQ-2, Löwe et al., 2005; and GAD-2, Löwe et al., 2009) in order to establish an easy and brief screening for DP.

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Against this background the present study analyzes data from a large community sample of  $n=5000$  participants to examine the following research questions:

- 1) What is the current prevalence rate of DP in a large community sample according to the CDS-2 and how is DP related to depression and anxiety symptoms according to ultra-brief screeners and the respective medical histories?
- 2) Can DP be differentiated from anxiety and depression, and does DP have an independent effect on the subjective physical and mental health status in the community?

Answers to these questions will help to determine whether DP contributes to the health status beyond anxiety and depression, and thus might ascertain the potential value of implementing the CDS-2 in routine screening procedures.

## 2. Methods

### 2.1. Study sample

The sample comprises cross-sectional data of the first  $n=5000$  participants enrolled in the Gutenberg Heart Study (GHS) from April 2007 to October 2008. The GHS is a community-based, prospective, observational single-center cohort study focusing cardiovascular disease in the Rhein-Main-Region in western Mid-Germany (Michal et al., 2010b). The GHS has been approved by the local ethics committee and by the local and federal data safety commissioners. The sample was drawn randomly from the local registry in the city of Mainz and the district of Mainz-Bingen. The sample was stratified 1:1 for gender and residence, and in equal strata for decades of age. Inclusion criteria were age 35 to 74 years and written informed consent. Persons with insufficient knowledge of the German language, or a physical or mental inability to participate were excluded. The characteristics of the sample are displayed in Table 1. The response rate, defined as the number of persons with participation in or appointment for the baseline examination divided by the sum of number of persons with participation in or appointment for the baseline examination plus those with refusal and those who were not contactable, was 60.3%. Due to the ongoing recruitment of the GHS, which is conducted in waves, a concluding statement concerning the response rate cannot be made yet.

### 2.2. Assessment

The 5-hour baseline-examination in the study center comprised evaluation of prevalent cardiovascular risk factors and clinical variables, laboratory examinations, a computer-assisted personal interview, and self rating questionnaires.

Depersonalization was assessed with the CDS-2, the two-item version of the CDS. The CDS-2 comprises two items of the CDS that best discriminate between patients with clinically significant DP and patients without clinically significant DP (i.e. item 13 of the CDS "My surroundings feel detached or unreal, as if there was a veil between me and the outside world" and item 1 "Out of the blue, I feel strange, as if I were not real or as if I were cut off from the world"). The response format of the CDS-2 was adopted from the Patient Health Questionnaire ("Over the last 2 weeks, how often have you been bothered by any of the following problems?/Not at all=0/

Several days=1/More than half the days=2/Nearly every day=3" (Löwe et al., 2005; Michal et al., 2010c). The CDS-2 was originally tested in a sample of 38 patients with clinically significant DP-DR and 49 patients without or with only mild DP-DR. Scores were compared against clinical diagnoses based on the Depersonalization Severity Scale as the gold standard (DSS, Simeon et al., 2001; Michal et al., 2010c). The CDS-2 showed high reliability (Cronbach's Alpha=0.92) and was able to differentiate patients with clinically significant DP well from other groups (cut-off of CDS-2 $\geq$ 3, sensitivity=78.9%, specificity=85.7%). The CDS-2 sum score (range 0–6) correlated strongly ( $r=0.77$ ) with depersonalization severity according to the DSS (Michal et al., 2010c).

Anxiety was measured by using the two-item version of the GAD-7 (Löwe et al., 2010). A cut-off score of 3 or more detects current generalized anxiety disorder with a sensitivity of 86% and a specificity of 83%, and any current anxiety disorder (GAD, panic disorder, social phobia, post-traumatic stress disorder) with a sensitivity of 65% and specificity of 88% (Skapinakis, 2007).

Depression was measured with the two-item Patient Health Questionnaire (PHQ-2). A cut-off score of 3 or more yielded a sensitivity of 79% and a specificity of 86% for any depressive disorder (Löwe et al., 2005).

Mental and somatic subjective health status was assessed by the questions "How would you describe your current mental health status?" and "How would you describe your current somatic health status?" ("very good=1", "good=2", "less good=3", "bad=4"). A binary variable impaired physical resp. mental health status was denoted by recoding either "less good" or "bad" as impaired physical resp. mental health status and either "very good" or "good" as not impaired health status.

A medical history (MH) of any depression and any anxiety disorder was assessed by two questions during the computer-assisted personal interview ("Have you ever received the definite diagnosis of any depressive disorder/any anxiety disorder by a physician?").

The socioeconomic status (SES) was defined according to Lampert's and Kroll's Scores (Lampert and Kroll, 2009) of SES with a range from 3 to 27 while 3 indicates the lowest SES and 27 the highest SES.

### 2.3. Statistical analysis

The unweighted data were analyzed descriptively. The CDS-2 items were examined via Spearman correlations. Cronbach's Alpha was used to assess the CDS-2 reliability. Odds ratios, obtained from logistic regression analyses, were used to estimate the associations of impaired health status, medical histories of any depressive or anxiety disorder with PHQ-2, GAD-2 and CDS-2. A principal component analysis with varimax rotation was performed on the pooled items of the CDS-2, PHQ-2 and GAD-2 to evaluate the distinctiveness of the scales. To examine the difference in location parameter of the CDS-2 score, in groups with different symptoms of depersonalization, the Wilcoxon test was used. *P*-values are presented for descriptive purposes. All analyses were performed with the statistical software package SAS (Version 9.2, SAS Institute Inc., Cary, NC, USA).

## 3. Results

### 3.1. Characteristics of the sample stratified by CDS-2 $\geq$ 3

A percentage of 0.8% (0.6–1.1) of the participants scored in the range of clinically significant DP (CDS-2 $\geq$ 3, DP group). Subjects with clinically significant DP were less likely to live in a current

**Table 1**  
Characteristics of the sample stratified by clinically significant depersonalization (CDS-2 $\geq$ 3).

	Total sample ( <i>N</i> =5000)	Comparison by CDS-2 $\geq$ 3		Crude OR (95% CI)	<i>p</i>
		CDS-2<3 ( <i>N</i> =4859)	CDS-2 $\geq$ 3 ( <i>N</i> =41)		
Age, years, mean $\pm$ SD	55.5 $\pm$ 10.9	55.4 $\pm$ 10.9	53.3 $\pm$ 10.0	0.98 (0.95–1.01)	0.21
Gender, female, % ( <i>N</i> )	49.2 (2460)	49.1 (2387)	48.8 (20)	0.99 (0.53–1.82)	0.96
Partnership, yes, % ( <i>N</i> )	82.3 (4111)	82.6 (4010)	65.9 (27)	<b>0.41 (0.21–0.78)</b>	<b>0.0067</b>
Education					
Less than 10th grade, % ( <i>N</i> )	43.5 (2102)	43.0 (2021)	40.0 (16)	1.15 (0.81–1.64)	0.43
Completed 10th grade, % ( <i>N</i> )	22.3 (1077)	22.5 (1057)	17.5 (7)		
Completed high school, % ( <i>N</i> )	34.2 (1652)	34.6 (1626)	42.5 (17)		
Professional education					
College or university degree, % ( <i>N</i> )	24.5 (1192)	24.8 (1175)	32.5 (13)	<b>1.29 (1.03–1.61)</b>	<b>0.025</b>
SES (3–21), mean $\pm$ SD	12.7 $\pm$ 4.4	12.8 $\pm$ 4.4	12.8 $\pm$ 4.9	1.00 (0.93–1.07)	0.97
Anxiety, GAD-2 $\geq$ 3, % ( <i>N</i> )	6.1 (299)	5.6 (269)	63.4 (26)	<b>30.80 (15.86–59.81)</b>	<b>&lt;0.0001</b>
Depression, PHQ-2 $\geq$ 3, % ( <i>N</i> )	5.7 (282)	5.2 (251)	70.7 (29)	<b>44.26 (22.32–87.77)</b>	<b>&lt;0.0001</b>
MH of any depressive disorder, % ( <i>N</i> )	11.3 (562)	10.9 (527)	53.7 (22)	<b>9.50 (5.11–17.67)</b>	<b>&lt;0.0001</b>
MH of any anxiety disorder, % ( <i>N</i> )	6.5 (325)	6.3 (304)	26.8 (11)	<b>5.48 (2.72–11.04)</b>	<b>&lt;0.0001</b>
Physical health status (1–4), mean $\pm$ SD	2.1 $\pm$ 0.7	2.1 $\pm$ 0.7	2.8 $\pm$ 0.9	<b>3.93 (2.68–5.76)</b>	<b>&lt;0.0001</b>
Mental health status (1–4), mean $\pm$ SD	2.0 $\pm$ 0.7	2.0 $\pm$ 0.6	3.1 $\pm$ 0.7	<b>7.15 (4.81–10.64)</b>	<b>&lt;0.0001</b>

$p<0.05$  in bold emphasis.

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