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# ICD-11 personality disorder features in the danish general population: Cut-offs and prevalence rates for severity levels

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## ABSTRACT

**Introduction:** Prevalence rates and correlates of personality disorders (PD) are relevant to health care policy and planning.

**Objectives:** To present normative data for self-reported ICD-11 personality disorder (PD) features including tentative cut-off scores and prevalence rates for severity levels along with psychosocial correlates.

**Methods:** The Personality Disorder Severity ICD-11 (PDS-ICD-11) scale and criterion measures of impairment were administered to a social-demographically stratified sample of Danish citizens ( $N = 8,941$ ) of which 3,044 delivered complete data. Item-Response Theory (IRT) was employed to indicate cut-offs based on standard deviations from the latent mean.

**Results:** The unidimensionality of the PDS-ICD-11 score was supported and IRT analysis suggested norm-based thresholds at latent severity levels. Expected associations with criterion measures were found.

**Conclusion:** The normative data portray ICD-11 PD features in the general population and allow for interpretation of PDS-ICD-11 scores (e.g., scores of 12, 16, and 19 may indicate mild, moderate, and severe dysfunction), which may inform health care policy and planning. A total weighted prevalence of 6.9 % of the Danish general population is estimated to have clinically significant personality dysfunction, proportionally composed of Mild (4.8 %), Moderate (1.2 %), and Severe (0.9 %) levels. Future research should corroborate these findings using relevant clinical samples and methods.

## 1. Background

World Health Organization (WHO) member states are in the process of migrating from ICD-10 to ICD-11, which involves a fundamental change in the classification of Personality Disorder (PD) from categorical PD types to a dimension of PD severity (Bach et al., 2022; Reed, 2018). The new ICD-11 approach is essentially based on a five-level dimension of personality dysfunction that clinical practitioners may classify into the following categories: (0) none, (1) sub-diagnostic personality difficulty, (2) mild PD, (3) moderate PD, and (4) severe PD. However, from a quantitative research perspective, the PD dimension comprises one global continuum ranging from healthy personality

functioning to severe PD. Additionally, the individual stylistic expressions of personality dysfunction may be coded in terms of five trait domain specifiers (i.e., negative affectivity, detachment, dissociation, disinhibition, and anankastia) along with an optional borderline pattern specifier (WHO, 2023).

The ICD-11 dimension of PD severity, which is the topic of the current paper, relies on the core capacities of self- and interpersonal functioning (e.g., identity problems and conflictual relationships), which are largely consistent with the DSM-5 Alternative Model of Personality Disorders (AMPD) (Bach and Mulder, 2022; Bender et al., 2011). Moreover, the ICD-11 determination of PD severity also relies on emotional (e.g., alexithymia), cognitive (e.g., reality testing), and

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behavioural (e.g., harm to self or others) manifestations of the personality dysfunction as well as overall psychosocial impairment and distress (WHO, 2023). A PD diagnosis is characterized by problems in these areas that have persisted over an extended period of time (e.g., 2 years or more). See abbreviated definitions of severity levels in Table 1.

There are several reasons for replacing the traditional PD diagnoses with a dimension of overall PD severity (Bender et al., 2011; Clark et al., 2018; Crawford et al., 2011). First, a severity dimension captures the full range of personality dysfunction including sub-threshold information that is neglected by the dichotomous thresholds that are used in the established ICD-10 and DSM-5 categorical PD diagnoses (Karukivi et al., 2017; Morgan et al., 2013; Zimmerman et al., 2013). Second, a PD severity dimension enables mental health services to identify those who have the greatest level of personality dysfunction and thereby helping service providers allocate their resources and target their interventions more effectively in terms of appropriate treatment intensity (Bach and Simonsen, 2021; Koelen et al., 2012). Third, baseline PD severity is a more sound predictor of psychosocial impairment (Buer Christensen et al., 2020; Wright et al., 2016) and expected treatment outcome (Bach and Simonsen, 2021; Storebø et al., 2020). Fourth, a PD severity dimension is a general measure for evaluation of change in individuals with a PD diagnosis (Weekers et al., 2020). For example, in response to treatment, a patient may have recovered from a severe to a more moderate level of dysfunction (Crawford et al., 2011; Morey et al., 2013). Fifth, there is evidence that clinicians and researchers welcome

**Table 1**  
Definitions of ICD-11 levels of personality dysfunction.

Difficulty (sub-diagnostic)	Mild PD	Moderate PD	Severe PD
Only intermittent or low-intensity manifestations in cognitive and emotional experience and expression (e.g., during times of stress).	Some areas of personality functioning are affected but not others (e.g., problems with self-direction in the absence of problems with identity or self-worth) and may not be apparent in some contexts.	Multiple areas of personality functioning (e.g., identity or sense of self, ability to form intimate relationships, ability to control impulses and modulate behavior) are affected, while certain areas of personality functioning may be relatively less affected.	Most, if not all, areas of personality functioning are severely impaired (e.g., sense of self may be so unstable that individuals report not having a sense of who they are; self-view may be characterized by self-contempt or grandiosity).
Insufficiently severe to cause notable disruption in social, occupational, and interpersonal relationships, and may be limited to specific relationships or situations.	Many interpersonal relationships and/or expected occupational and social roles are characterized by problems, but some relationships are maintained and/or some roles are carried out.	Most interpersonal relationships are marked by problems, and the performance of most expected social and occupational roles are compromised to some degree.	Virtually all relationships, and the ability and willingness to perform expected social and occupational roles are absent or severely compromised.
Reality testing remains intact.	Reality testing typically remains intact.	There may be mild psychotic-like beliefs or perceptions (e.g., paranoid ideas), under stress.	Often psychotic-like beliefs or perceptions (e.g., extreme paranoid reactions), under stress.
Not associated with harm to self or others.	Typically not associated with substantial harm to self or others.	Sometimes associated with harm to self or others	Often associated with harm to self or others

Note. Abbreviated features and examples of ICD-11 levels of personality dysfunction (WHO, 2023).

the move toward such a PD severity dimension with respect to ease of use, utility for treatment planning, and scientific purposes (Brown et al., 2023; Hansen et al., 2019; Hopwood et al., 2018; Morey and Hopwood, 2019; Tracy et al., 2021). Finally, and most relevant for the present study, a global severity dimension that captures core features of personality dysfunction seems more suitable for epidemiological research and estimation of prevalence rates in the general community according to different severity levels and expected burden of disease (Bach et al., 2022, 2020; Clark et al., 2018; Crawford et al., 2011; Prevolnik Rupel et al., 2021; Tyrer et al., 2019; Volkert et al., 2018).

1.1. Estimation of personality disorder features in the general population

In recent years, two meta-analyses have provided an overview of PD prevalence rates for Western and global communities, respectively. The meta-analysis for Western countries included ten studies of both self-reported and expert-rated data, which indicated that the median prevalence rate for any PD was 12.16 % (95 % CI, 8.01–17.02 %), which is composed of co-occurring categories of Paranoid (3.02 %), Schizoid (2.82 %), Schizotypal (3.04 %), Borderline (1.90 %), Histrionic (0.83 %), Antisocial (3.05 %), Narcissistic (1.23 %), Avoidant (2.78 %), Dependent (0.78 %), and Obsessive-compulsive (4.32 %) (Volkert et al., 2018). The meta-analysis for global prevalence included 46 studies from 6 continents, which showed that a worldwide pooled prevalence of any PD was 7.8 % (95 % CI 6.1–9.5) (Winsper et al., 2020). Thus, it might be expected that the prevalence of pronounced personality dysfunction on a global PD dimension would correspond to the prevalence rate for any PD, ranging between 7.8 % and 12.16 % of the general community. This is consistent with findings from a Danish national sample (N = 50,326), where 11.3 % fulfilled the estimated PD screening criteria for the self-report form of the Standardized Assessment of Personality - Abbreviated Scale (SAPAS-SR) (Bach et al., 2020). However, because the PD diagnosis has been extensively changed, we certainly need estimated cut-offs for severity levels that correspond to the new ICD-11 definitions along with their general population prevalence rates (Bach et al., 2022; Volkert et al., 2018). Such severity thresholds and their prevalence rates are considered particularly relevant for health care policy and planning (Tyrer and Mulder, 2022).

1.2. Aims of the study

The aim of this study is to present normative data for self-reported ICD-11 PD features including tentative cut-off scores and prevalence rates for severity levels along with psychosocial correlates. Although the norms are derived from the Danish population, we anticipate that they apply to other social-economically comparable Nordic and Western societies (Arnfred et al., 2019). We employed the Danish version of the recently developed Personality Disorder Severity – ICD-11 (PDS-ICD-11) scale (Bach et al., 2021), which we initially evaluated with respect to dimensionality and structural validity. See the method section for a detailed description of the PDS-ICD-11 scale.

2. Methods

2.1. Participants and procedures

The participants included in the study were designated from a representative general population sample (N = 8941) of which 3044 individuals eventually contributed with data (34 % response rate). A total of 134 individuals did not deliver complete data.

To ensure true normative qualities of the data, we used a data-collection method based on the Danish Civil Population Register (CPR). More specifically, at birth or time of immigration, all Danish citizens are provided with a unique personal identification number registered in the Danish Civil Population Register (CPR). In the current study, CPR-numbers for a representative sample of the general Danish population were extracted using the Statistics Denmark’s Research

Services.

First, a representative sample of 8941 citizens was drawn randomly from the CPR-register of Danish citizens aged 18–80, which corresponded to at least 70 men and 70 women from each age-group. This sample was stratified for sociodemographic factors including sex, age, ethnic origin, educational level, occupational status, relationship status (e.g., single or in a relationship), family type (e.g., with or without children), household income, and degree of urbanization (e.g., composition of citizens living in cities, towns, or in rural areas). In this way, the sample characteristics were approximately matched with the actual composition of the general population (see Table 2).

Next, a computerized version of the PDS-ICD-11 scale along with external criterion measures (see “Measures”) were sent to individuals from the aforementioned derivation sample. This procedure was carried out by means of digital post (“E-boks”), which is securely linked to CPR-numbers and must be used by all Danish citizens. Non-responders received up to two reminders, and after the second reminder, their information was destroyed. According to estimates from Statistics Denmark, approximately 8 % of the adult general population are not reading their digital post (typically recipients above 70 years old). The self-report measures were therefore sent by regular letter to participants that were not expected to read their digital post, including two reminders. All data collection took place between June 2nd and September

**Table 2**  
Socio-demographics for respondents and derivation population.

	Respondents	Population
Total	3044	4437,668
<i>Sex (%)</i>		
Male	44.2	49.9
Female	55.8	50.1
<i>Age group (%)</i>		
18–29	20.4	22.5
30–39	8.2	15.4
40–49	15.1	17.1
50–59	20.1	17.9
60–69	21.3	14.8
70+	14.9	12.3
<i>Ethnic origin (%)</i>		
Danish	93.0	85.5
Immigrant	7.0	14.5
<i>Family type (%)</i>		
Single without children	23.9	30.1
Single with children	6.1	5.7
Couple without children	41.9	33.7
Couple with children	28.1	30.5
<i>Highest completed education (%)</i>		
Primary school or none	24.5	26.7
High school	39.9	41.0
Lower level education	22.1	19.8
At least bachelor level	13.5	12.5
<i>Occupational status (%)</i>		
Employed	54.7	56.3
Retired	25.1	22.0
Unemployed	20.2	21.7
<i>Family income (1000 DKK) (%)</i>		
100–150	13.2	21.9
150–250	29.4	31.5
250–350	29.0	25.5
350–500	20.5	15.2
+500	7.9	5.9
<i>Degree of urbanization (%)</i>		
Most densely populated area	32.7	36.1
Medium populated area	33.5	31.6
Sparsely populated area	33.8	32.4

28th 2020.

The study was approved by The Danish Data Agency (REG-063–2018), and all data were anonymized before being analyzed so that no participant could be identified. According to Danish law, ethical approval was not required due to the nature of the study.

2.2. Measures

2.2.1. The personality disorder severity ICD-11 (PDS-ICD-11) scale

The PDS-ICD-11 is a 14-item self-report measure assessing the ICD-11 definitions of self- and interpersonal dysfunction along with emotional, cognitive, and behavioral manifestations and psychosocial impairment and/or distress. As illustrated in Table 3, the items describe impairments related to aspects of the self (four items), interpersonal functioning (four items), and regulation of emotions (one item), cognitions (one item), and behavior (three items). A final item covers the general psychosocial impairment. For each item, respondents are asked to select the description that best fits their level of functioning from up to five descriptions. The first ten items are bipolar in which the middle response reflects normal functioning, while the four last items are unipolar. Responses are scaled according to the severity of impairment of the selected descriptions and summed to a total score ranging from 0 to 32. The Danish version of the PDS-ICD-11, used in this study, was translated and back-translated as a part of the initial development of the original English version (see further details in Bach et al., 2021).

To date, the unidimensionality and structural validity of the PDS-ICD-11 scale score has overall been supported in U.S. and German community samples (Bach et al., 2021; Zimmermann et al., 2022) as well as a Spanish mixed community-clinical sample (Gutiérrez et al., 2022b) (see factor loadings reported in supplemental Table 2). Notably, the unidimensional structural validity was most sound in the Spanish sample where clinical participants were included (Gutiérrez et al., 2022b). Moreover, clinical research from New Zealand has supported the utility of the PDS-ICD-11 scale in differentiating mental health patients with a clinician-rated ICD-11 PD diagnosis from those without (Bach et al., 2021; Brown and Sellbom, 2023), along with promising convergence between patient-report and clinician-report forms of the PDS-ICD-11 scale (Brown and Sellbom, 2023, 2022). Recent findings also show that self-reported and clinician-rated PDS-ICD-11 scores are substantially correlated, which indicates that the composition of self-reported data in the present study may be generalized to clinician-ratings (Sellbom, Brown, & Bach, in review). The internal consistency of the PDS-ICD-11 score in the current study was good in terms of McDonald’s  $\omega = 0.83$ . In the present study, we determined the

**Table 3**  
Factor loadings for the Danish PDS-ICD-11 in Comparison to U.S., German, and Spanish findings.

	Denmark	U.S.	Germany	Spain
1. Identity	.44	.73	.82	.69
2. Self-worth	.78	.83	.81	.82
3. Self-perception	.55	.55	.65	.73
4. Goals	.68	.73	.67	.68
5. Interest in relationships	.72	.72	.64	.73
6. Perspective taking	.67	.60	.57	.64
7. Mutuality in relationships	.75	.70	.66	.80
8. Disagreement management	.62	.66	.66	.68
9. Emotional control and expression	.65	.71	.65	.83
10. Behavioral control	.70	.76	.68	.76
11. Experience of reality during stress	.66	.55	.60	.59
12. Harm to self	.47	.59	.54	.66
13. Harm to others	.28	.42	.24	.50
14. Psychosocial impairment	.69	.62	.61	.78
Median item loading	.67	.68	.63	.71

Note. Denmark (N = 3044; community); U.S. (N = 428; community); Germany (N = 1278; community); Spain (N = 726; community and clinical). Standardized factor loadings are from Confirmatory Factor Analysis (CFA).

internal consistency using McDonald's  $\omega$  rather than Cronbach's  $\alpha$  because it tends to be favored as a more optimal measure of scale reliability, particularly when unidimensional latent constructs can be estimated (Hayes and Coutts, 2020).

### 2.2.2. The level of personality functioning scale brief form 2.0 (LPFS-BF 2.0)

The LPFS-BF 2.0 is a 12-item self-report measure assessing impairment in self- and interpersonal functioning (Weekers et al., 2019). The items correspond to the 12 facets of the LPFS as described in Section III of DSM-5 (APA, 2013). Respondents are asked to rate each item on a Likert-scale from 1 (completely untrue) to 4 (completely true). The clinical validity of the Danish LPFS-BF has been supported (Bach and Hutsebaut, 2018; Weekers et al., 2022). Internal consistency of the LPFS-BF score in the current study was sound (McDonald's  $\omega$  of 0.90).

### 2.2.3. The EuroQol 5D (EQ-5D-5L)

The EQ-5D-5L is the internationally preferred self-report instrument for evaluation of health-related quality of life in health economic evaluations (Herdman et al., 2011). The respondent is asked to indicate his health state in five domains: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has three impairment levels: no problems, slight problems, moderate problems, severe problems, and unable. The EQ-5D-5L has been found specifically useful for evaluation of quality of life in persons with PD (van Asselt et al., 2009), and the utility of the Danish version for measuring population health has been supported (Jensen et al., 2023). The internal consistency of the EQ-5D-5L score in the current study was sound (McDonald's  $\omega$  = 0.78).

### 2.2.4. The EuroQol visual analogue scale (EQ VAS)

The EQ-VAS is a part of the EQ-5D-5L and presents the respondent's self-rated health on a visual analogue scale ranging from 0 'best imaginable health state' to 100 'worst imaginable health state' (EuroQol-Group, 1990). Research supports the utility of the EQ VAS for revealing levels of severity across different patient groups (Teni et al., 2023).

### 2.2.5. The work and social adjustment scale (WSAS)

The WSAS is a 5-item self-report measure assessing impairments in social- and occupational functioning (Mundt et al., 2002). The measure specifically assesses the impact of mental health problems on the ability to function in terms of work, home management, social- and private leisure, and close relationships. A Norwegian study found the WSAS to be a useful measure of functional impairment in patients with PD (Pedersen et al., 2017). The internal consistency of the WSAS score in the current study was high (McDonald's  $\omega$  = 0.92).

## 2.3. Statistical analysis

First, to examine whether the PDS-ICD-11 score reflects a unidimensional severity index, which would be necessary to support the interpretation of a total severity score, we evaluated the internal structure by estimating a one-factor confirmatory factor analysis (CFA) model. Because items are polychotomous, we used a robust weighted least squares estimator (i.e., mean and variance-adjusted WLS in Mplus). Conventional model fit indices were used to evaluate global model fit (i.e., Comparative Fit Index [CFI] and Tucker-Lewis Index [TLI] > 0.90, root mean square error of approximation [RMSEA]) and individual item parameters to evaluate local fit.

In addition, we estimated item response theory parameters based on Samejima's graded response model to evaluate item difficulty and item discrimination parameters as well as overall test information. This information was used to estimate a test characteristic curve (TCC) to show the estimated observed scores across the range of the latent construct (theta). In other words, the TCC was used to establish normative

observed score thresholds at different latent severity levels. Because theta is expressed in z-score units, the tentative cut-off scores were estimated based on standard deviations (SD) from the latent mean, consistent with the generation of standardized scores (e.g., T-scores). Thus, established clinical scales, such as those included in the Minnesota Multiphasic Personality Inventory-3 (MMPI-3; Ben-Porath and Tellegen, 2020) and the Personality Assessment Inventory (PAI; Morey, 2007), use norm-based thresholds where 1.5 SD, 2.0 SD, and 2.5 SD indicate significant levels of dysfunction. In a similar way, the diagnosis of osteoporosis is based on 2.5 SD below the mean bone density in the general population while 1 SD below the mean corresponds to the less severe diagnosis of osteopenia (Karaguzel and Holick, 2010). As illustrated in Fig. 1, we therefore focused on theta values in the range of +1 SD, +1½ SD, +2 SD, +2½ SD, and +3 SD, which we anticipated to capture PD features from subthreshold to the most extreme forms of personality dysfunction.

## 3. Results

### 3.1. Characteristics of the study population

Table 2 presents the social-demographically stratified sample characteristics in relation to their composition in the derivation population. Table 4 presents descriptive statistics (i.e., normative data) for the PDS-ICD-11 score, which include specific scores for sex and aggregated age groups. Statistical weights were applied to ensure that the derived sample is representative of the target population (e.g., accounting for non-responses). Observed sex and regional differences were not statistically significant.

### 3.2. Unidimensionality of the PD severity measure

The unidimensionality of the PDS-ICD-11 score was supported in terms of a one-factor CFA model with adequate model fit ( $\chi^2 = 919.11$  [df=77,  $p < .001$ ], CFI = 0.95, TLI = 0.94, and RMSEA = 0.063), which is largely comparable with findings in the U.S., German, and Spanish studies (Bach et al., 2021; Gutiérrez et al., 2022b; Zimmermann et al., 2022). As shown in Table 3, the median loading coefficient was 0.67, ranging from 0.28 ("harm to others") to 0.78 ("self-worth"), which overall corresponds to the composition of loading patterns found in U.S. and German community samples (Bach et al., 2021; Zimmermann et al., 2022).

The supplemental Table S1 lists the IRT parameters for the 14 items

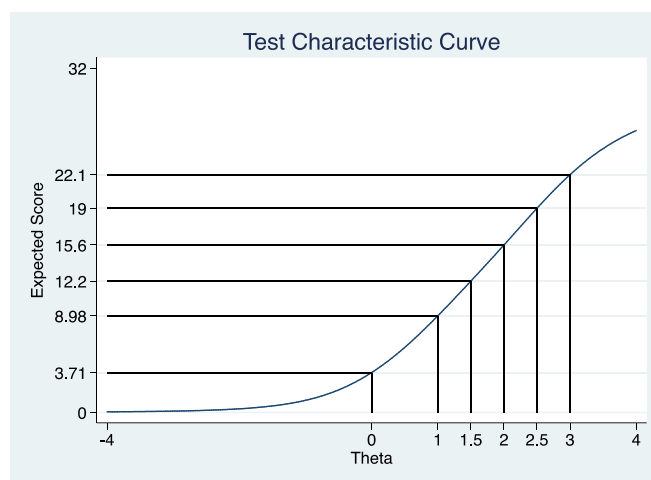


Fig. 1. Test characteristics showing PDS-ICD-11 cut-offs based on standard deviations from the latent mean. Note. 1 SD = Sub-threshold difficulty, 1.5 SD = Mild dysfunction, 2.0 SD = Moderate dysfunction, 2.5 SD = Severe dysfunction, 3 SD = Extreme dysfunction.

**Table 4**  
Descriptive Statistics Showing Unweighted and Weighted Representative General Population Norms.

	Total			Total weighted			Females			Females weighted			Males			Males weighted		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Total	2910	4.78	4.34	4.4mio	5.21	4.57	1605	4.81	4.20	2.2mio	5.36	4.41	1305	4.74	4.50	2.2mio	5.06	4.73
17–29 years	613	7.19	4.51	1.0mio	7.23	4.51	350	7.42	4.41	0.5mio	6.87	4.52	263	6.88	4.62	0.5mio	7.53	4.48
30–39 years	265	6.11	4.59	0.7mio	6.35	4.78	159	5.82	4.20	0.4mio	6.59	5.23	106	6.56	5.11	0.3mio	6.18	4.44
40–49 years	445	4.99	4.55	0.8mio	5.15	4.82	253	5.06	4.11	0.4mio	5.02	5.40	192	4.89	5.08	0.4mio	5.26	4.21
50–59 years	577	4.10	4.00	0.8mio	4.30	4.17	299	4.16	4.15	0.3mio	4.18	3.96	278	4.03	3.83	0.5mio	4.45	4.42
60–69 years	592	3.23	3.53	0.7mio	3.55	3.93	329	3.05	3.14	0.3mio	3.87	4.41	263	3.44	3.96	0.3mio	3.19	3.25
70–79 years	418	3.32	3.23	0.5mio	3.53	3.41	215	3.09	2.90	0.2mio	3.64	3.70	203	3.56	3.53	0.3mio	3.40	3.01

Note. Weighted = based on frequency weights according to the composition of the target population.

of the PDS-ICD-11 scale. As evident from this table, nearly all items showed acceptable discrimination parameters, with item 13 (“Harm to Others”) and item 12 (“Harm to Self”) being associated with the worst discrimination. Moreover, supplemental Figure S1 shows the overall test information function with standard error of measurement plotted against it, which indicates that the most reliable measurement appears to occur between approximately a theta of 0 and 3, which is what would be expected for an impairment measure in the general population.

### 3.3. Norm-based cut-off scores and community prevalence rates

The test characteristic curve in Fig. 1 shows the expected observed scores across the range of theta, and indicates that an observed score of 8.98 would be associated with a theta of 1.0, a score of 12.2 would be associated with a theta of 1.5, a score of 15.6 would be associated with a theta of 2.0, a score of 19.0 would be associated with a theta of 2.5, and a score of 22.1 would be associated with a theta of 3.0.

Table 5 presents prevalence rates for PDS-ICD-11 severity levels that are based on the aforementioned cut-off scores rounded up or down to the nearest whole number. Again, statistical weights were applied to ensure that the estimated prevalence rates are representative of the target population (e.g., accounting for non-responses). Level 1 of personality dysfunction (i.e., a score of at least 9) applies to 8.2 % [9.6 % w. weights] of the general population. In the most extreme end, level 5 (i.e., a score of at least 22) applies to only 0.3 % [0.4 % w. weights] of the general population. Of the total sample, only 13.8 % [12.7 % w. weights] did not endorse any level of personality dysfunction (i.e., a score of 0).

### 3.4. Psychosocial correlates

As shown in Table 6, the PDS-ICD-11 score was substantially correlated with LPFS-BF, WSAS, and EQ-5D-5 L scores, in that order, and negatively correlated with the EQ VAS score. Notably, the correlations with the psychosocial variables were stronger for the PDS-ICD-11 score in comparison to the LPFS-BF score. The correlation between PDS-ICD-11 and the LPFS-BF was 0.67, which indicates that the two PD severity measures are substantially overlapping but not isomorphic.

## 4. Discussion

As a precondition for meaningful interpretation of findings in the present study, the applied PDS-ICD-11 scale demonstrated appropriate psychometric properties in terms of unidimensionality and expected correlations with personality, social, and occupational impairments as well as a negative correlation with quality of life. The magnitude of all correlations was very large, except for EQ-VAS (i.e., self-rated health), which only showed a large correlation (Funder and Ozer, 2019).

The study showed that self-reported ICD-11 PD severity in a general population sample can be meaningfully categorized into levels of severity based on norm-based cut-off scores. According to suggested thresholds (i.e., 1.5 SD, 2 SD, and 2.5 SD), we found that 5.1 % (6.9% w. weights) of the general Danish community have at least a mild level of personality dysfunction, 1.6% (2.1 % w. weights) have at least moderate level of personality dysfunction, and only 0.6 % (0.9 % w. weights) have severe or extreme personality dysfunction. The applied cut-off scores of 12, 16, and 19 may likely correspond to Mild PD, Moderate PD, and Severe PD, whereas a score somewhere between 9 and 12 may likely indicate sub-threshold personality difficulty. These findings are also consistent with clinical research showing that a PDS-ICD-11 cut-score of 14 was optimal in differentiating PD from no PD/difficulty, while the mean score for mild PD was 15 (SD = 3.7) and a combined moderate/severe PD group was 18 (SD = 4.3) (Brown and Sellbom, 2023). Accordingly, this may tentatively indicate community prevalence rates for Mild PD (3.5%; 4.8 % w. weights), Moderate PD (1.0 %; 1.2 % w. weights), and Severe PD (0.6%; 0.9 % w. weights) for the entire

**Table 5**  
Unweighted and weighted prevalence rates of different PDS-ICD-11 severity levels.

			Total			Females			Males		
			N	%	Weighted%	N	%	Weighted%	N	%	Weighted%
Level	#SD	Sum score	2910		4.4mio	1605		2.2mio	1305		2.2mio
None		= 0	445	13.8	12.7	245	13.8	12.4	200	13.7	13.1
Level 0	+ 0 SD	≥ 4	1073	33.2	36.8	611	34.5	39.3	462	31.7	34.3
Level 1	+ 1 SD	≥ 9	264	8.2	9.6	157	8.9	11.1	107	7.3	8.0
Level 2	+ 1½ SD	≥ 12	164	5.1	6.9	94	5.3	7.2	70	4.8	6.5
Level 3	+ 2 SD	≥ 16	52	1.6	2.1	214	1.2	1.4	31	2.1	2.7
Level 4	+ 2½ SD	≥ 19	18	0.6	0.9	6	0.3	0.5	12	0.8	1.3
Level 5	+ 3 SD	≥ 22	9	0.3	0.4	5	0.3	0.5	4	0.3	0.3

Note. Weighted = based on frequency weights according to the composition of the target population.

**Table 6**  
Inter-correlations with external criterion variables.

	PDS-ICD-11	LPFS-BF	EQ-5D	EQ VAS
PDS-ICD-11	–			
LPFS-BF	0.67	–		
EQ-5D-5L	0.42	0.40	–	
EQ VAS	–0.38	–0.36	–0.70	–
WSAS	0.44	0.42	0.81	–0.70

Note. n = 713; PDS-ICD-11 = Personality Disorder Severity ICD-11; LPFS-BF = Level of Personality Functioning Scale – Brief Form; EQ-5D = EuroQol Health-Related Quality of Life; EQ VAS = EuroQol Visual Analogue Scale (0–100) for self-rated overall health; WSAS = Work and Social Adjustment Scale. All correlations are significant at the 0.001 level.

population ranging from 18 to 80 years of age, while the younger population shows significantly higher prevalence rates.

As an alternative consideration, it may be appropriate to use a more restrictive score of 22 (i.e., 3 SD above the mean) as cut-off for the most severe level of PD. The prevalence rate for this severity level would only be 0.3 % (0.4% w. weights). Likewise, it may also be more appropriate to use a less conservative cut-off score of 9 (i.e., 1 SD above the latent mean) for the mildest level of personality dysfunction (including sub-threshold personality difficulty), which would apply to 8.2 % (9.6 % w. weights) of the general population.

Interestingly, only a minority of 13.8 % (12.7% w. weights) of the general population sample had no personality dysfunction at all, supporting that being human usually involves some problems in personality functioning. Similarly, a British study found that only 23 % of a national sample had no personality dysfunction (Yang et al., 2010).

The prevalence of 5.1 % (6.9 % w. weights) for the presence of clinically significant personality dysfunction (i.e., at least mild level) is lower than the meta-analytically derived prevalence of PD in Western countries with a confidence interval ranging between 8.01 % and 17.02% (Volkert et al., 2018), and most comparable to the global prevalence ranging between 6.1 % – 9.5 % (Winsper et al., 2020). Nevertheless, these established prevalence rates exclusively rely on meta-analyses based on traditional stylistic PD categories rather than general PD dysfunction, which may explain the mixed findings. Moreover, the prevalence estimate in Western communities includes Schizotypal PD (3.04 %), which does not count as PD features within the ICD-11 framework (Volkert et al., 2018). Finally, the prevalence observed in the present study is consistent with a recent French-Canadian study based on the AMPD, which indicated a general population PD prevalence of 5.9 % to 6.1 % (Le Corff et al., 2023).

Finally, as evident from the thematic content presented in Table 3, the ICD-11 PD severity model captures essential themes of the Borderline PD diagnosis (e.g., sense of self, self-directedness, quality of relationships, conflict management, emotion regulation, reality testing, and self-harm). Studies show that the PDS-ICD-11 score substantially accounts for the variance of a Borderline PD composite score (Bach et al., 2021; Brown and Sellbom, 2023; Gutiérrez et al., 2022b; Sellbom et al.,

2023). These findings are consistent with established research showing that a general factor, essentially composed of Borderline PD features, accounts for the global severity of personality pathology (Conway and Simms, 2020; Sharp et al., 2015; Williams et al., 2018). Thus, research suggests that the “borderline pattern” is a redundant specifier as it is sufficiently explained by severity and trait domain specifiers (Gutiérrez et al., 2022a; Mulder et al., 2020; Mulder and Tyrer, 2023). Taken together, the indicated overlap between Borderline PD and global PD severity aligns with the original use of the “borderline” construct as a global but heterogeneous metaphor for severity rather than a specific typology (Kernberg, 1967).

#### 4.1. Limitations and future directions

The present study is not without limitations, which may be addressed in future research. First, only 34 % of invited participants provided data for the present study, which we sought to account for using weights. Future studies might use a different approach that ensures a higher response rate (e.g., incitement for contributing to the study). Second, the study entirely relied on self-reported personality dysfunction and criterion variables, which may artificially inflate associations among measures due to mono-method bias. Yet, the international meta-analyses of prevalence rates included numerous self-report studies just like the present study. Furthermore, certain items may be less endorsed due to social desirability or denial (e.g., “causing harm to others” and “feeling superior to others”), which should be clarified in future studies. Future research should therefore also include clinician- or informant-ratings. Third, in some cases a PDS-ICD-11 score may potentially be attributed to other pervasive and persistent conditions characterized by self- and interpersonal issues such as Autism Spectrum Disorder (Bach and Vestergaard, 2023) and Complex PTSD (Felding et al., 2021), which usually overrule a PD diagnosis. In any case, the data presented in the current study reflect personality dysfunction without claiming any diagnosis. Fourth, statistically-based cutoffs (e.g., 1.5, 2.0, and 2.5 standard deviations above the mean) may be useful heuristics, but they should not be rarified as clinically-based cut points, as they require further evaluation. Future studies should therefore further evaluate the PDS-ICD-11 cut-off scores against clinician-rated personality dysfunction. Finally, the utility of the norm-based PDS-ICD-11 cut-off scores for countries beyond Denmark and other comparable Nordic and Western countries also needs to be explored.

#### CRedit authorship contribution statement

**Bo Bach:** Conceptualization, Project administration, Methodology, Formal analysis, Writing – original draft. **Erik Simonsen:** Writing – review & editing, Supervision. **Mickey T. Kongerslev:** Writing – review & editing. **Sune Bo:** Writing – review & editing. **Lene H. Hastrup:** Writing – review & editing. **Sebastian Simonsen:** Writing – review & editing. **Martin Sellbom:** Supervision, Methodology, Formal analysis, Writing – review & editing.

## Declaration of Competing Interest

None.

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.psychres.2023.115484](https://doi.org/10.1016/j.psychres.2023.115484).

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