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# Clinical characteristics of 217 Chinese cases with depersonalization/derealization disorder

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## Abstract

Depersonalization/derealization disorder (DPD) is a prevalent yet inadequately understood clinical condition characterized by a recurrent or persistent sense of unreality. This study aims to provide insight into DPD through descriptive and comparative analyses involving a large group of Chinese participants. The socio-demographic details (age, gender proportion, education, occupational status, marital status), depersonalized and dissociative symptom characteristics (symptomatic factors or subscales of the Cambridge Depersonalization Scale and the Dissociative Experiences Scale), development trajectory (age of onset, potential precipitating factors, course characteristics), treatment history (duration of delayed healthcare attendance, duration of delayed diagnosis, previous diagnoses), and adverse childhood experiences of the DPD patients are presented. Comparisons of anxiety and depressive symptoms, alongside psychosocial functioning, between DPD participants and those diagnosed with generalized anxiety disorder, bipolar disorders, and major depressive disorder were conducted. The analysis highlights a higher male preponderance and early onset of DPD, symptomatology marked by derealization, notable impairment in psychosocial functioning, and prolonged periods of delayed healthcare attendance and diagnosis associated with symptom severity. Furthermore, noteworthy relationships between adverse childhood experiences and symptom levels were identified. The findings substantiate the view that DPD is a serious but neglected mental disorder, urging initiatives to improve the current condition of DPD patients.

**Keywords** Depersonalization/derealization disorder, Clinical characteristics, Chinese population, Functional impairment, Delayed healthcare attendance, Delayed diagnosis

## Introduction

Depersonalization/derealization disorder (DPD), also known as depersonalization-derealization syndrome, is characterized by a sense of unreality regarding the subject's "self" or "surroundings" as outlined in the DSM-5 [1] and ICD-10 [2] criteria. DPD is a prevalent yet poorly understood condition that affects approximately 1% of the general population [3]. Despite its prevalence, a satisfactory therapeutic modality remains elusive and the etiological mechanisms are unclear [4].

The sense of unreality signifies an altered state of consciousness involving changes in an individual's emotions, sensations, thoughts, memories, and perceptions [5].

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Individuals with DPD may perceive their lives as distressing and meaningless, their surroundings as blurred and lifeless, their emotions as numb, and their memories as unfamiliar [6]. The symptoms are often perceived as strange and difficult to describe, contributing to ignorance and misunderstanding among family members or caregivers, and posing challenges for clinicians regarding identification and diagnosis. These factors can lead to delays in seeking healthcare and obtaining an accurate diagnosis, further exacerbating the plight of individuals with DPD [7].

Some clinical characteristics of DPD have been identified in prior case series studies. For example, there is a tendency for a 1:1 male-to-female ratio among individuals diagnosed with DPD, with a slightly higher proportion of males [7–10]. The onset age varies across studies, but the mean age is typically between 15 and 25 years [4, 7], indicating a tendency toward the early onset of DPD. Reports from Simeon et al.'s investigation [10] reveal that severe stress and marijuana use are the most frequently cited precipitating factors. High comorbidity with other psychiatric disorders is another consistent characteristic of DPD, most frequently with depressive and anxiety disorders [7, 8, 10].

However, these findings predominantly derive from Western countries, such as Germany, the United States (US), and the United Kingdom (UK), with little published research on Eastern populations representing diverse cultural and social backgrounds. Clinical and phenomenological features of mental disorders may exhibit significant variations across cultures and social contexts [11–14]. For instance, cultural stigma surrounding mental disorders can differ significantly, influencing how individuals perceive and report their symptoms and their willingness to seek treatment. In Western cultures, depression often presents with prominent affective symptoms like sadness and despair. In contrast, in Chinese culture, depression may manifest more through somatic symptoms such as fatigue, heartache, and other physical complaints [14]. These variations have critical implications for local clinicians regarding identification, measurement, and intervention.

Moreover, among previous descriptive analyses of the clinical characteristics of DPD, only Baker et al. [8] highlighted the severity of multiple dimensions of dissociation in a group of DPD patients using the Dissociative Experiences Scale (DES). However, they did not comprehensively delineate DPD-specific symptoms, such as anomalous emotional, temporal, or sensory experiences, which indicate distinct symptomatic connotations through factor analyses [15, 16]. Furthermore, although symptoms of DPD are often observed in anxiety disorders and mood disorders [4, 17], DPD remains a distinct clinical diagnosis, thus warranting investigations into the

unique and shared symptomatology and psychosocial functioning among these conditions. However, anxiety and depressive symptoms and psychosocial functioning in DPD patients were only compared with individuals diagnosed with depression in a prior case series study [7], omitting comparisons with other prevalent clinical conditions, such as anxiety disorders and bipolar disorders. Hence, this study aims to bridge the above gaps by conducting descriptive and comparative analyses of Chinese populations affected by DPD, generalized anxiety disorder (GAD), bipolar disorder (BD), and major depressive disorder (MDD) in the hope of furthering the understanding of this neglected disorder.

## Method

### Participants

Consecutive patients with primary complaints indicative of DPD, presenting to the outpatient clinic of Beijing Anding Hospital, Capital Medical University, between April 2020 and June 2023, were identified and diagnosed following DSM-5 criteria [1] by two senior psychiatrists. For comparison, three groups (BD, GAD, and MDD) consisted of participants who met the DSM-5 diagnostic criteria for bipolar I/bipolar II disorder, generalized anxiety disorder, or major depressive disorder and reported corresponding symptoms as their primary complaints. Patients aged 15 to 45 were included in the assessments for all diagnostic groups. This age range was selected because anxiety, depressive, and bipolar disorders have a high incidence rate before the age of 45, and DPD typically manifests between the ages of 15 and 25 [4, 7, 18]. Patients with (1) a history of brain trauma or substance addiction, (2) concurrent severe physical illness, or (3) clinically observable intellectual disability that prevented the assessments were excluded. For the comparison groups, patients with comorbid DPD or a diagnosis of another comparison disorder were excluded. Therefore, 217 patients with DPD, 110 with GAD, 244 with BD, and 75 with MDD were assessed.

### Measures

The participants underwent interviews to report socio-demographic information such as gender, age, years of education, and marital status. Clinical data pertinent to the development and course of DPD were also gathered, including the date of onset, potential precipitants of onset, date of the first visit to healthcare with DPD-related complaints, date of the first DPD diagnosis, and previous diagnoses. The interview used in this study was developed specifically for this research, and a detailed version is provided in the supplementary materials.

A precipitant for a mental disorder typically refers to a disruptive factor or event that occurs at the onset of the disorder [19]. In this study, factors or events reported by

patients as triggers for DPD onset were identified based on: (1) DPD onset during or immediately after the factor or event; (2) the patient perceived the factor or event as unusual, disturbing, or difficult to adapt to; and (3) the factor or event possessed biological or psychological plausibility (e.g., traumatic experiences often precipitate dissociative experiences).

#### **Measurement of depersonalized and dissociative symptoms**

To portray the dimensional distribution of DPD symptoms, the Cambridge Depersonalization Scale (CDS) was used. The CDS is a 29-item measure that prompts respondents to quantify the frequency and duration of depersonalized symptoms. It has demonstrated desirable internal consistency and reliability [20]. We adopted two relatively reliable CDS factor structures that delineate phenomenological facets of DPD: (1) “Anomalous Body Experience,” “Emotional Numbing,” “Anomalous Subjective Recall,” and “Alienation from Surroundings” [15], and (2) “Numbing,” “Unreality of Self,” “Perceptual Alterations,” “Unreality of Surroundings,” “Temporal Disintegration” [16]. In our sample, the CDS demonstrated excellent internal consistency (*Cronbach’s alpha*=0.951).

The Dissociative Experiences Scale (DES) [21] is a 28-item assessment designed to measure the severity of dissociation. The three-subscale solution [22] for DES was used in this investigation to capture the dissociative features in DPD: “Amnesia,” “Absorption and Imaginative Involvement (AI),” and “Depersonalization and Derealization (DpDr).” The DES exhibited excellent internal consistency within our sample (*Cronbach’s alpha*=0.925).

#### **Measurement of anxiety and depressive symptoms**

This study also incorporated clinician-rated scales. The 17-item Hamilton Rating Scale for Depression (HAM-D) [23] and the 14-item Hamilton Rating Scale for Anxiety (HAM-A) [24], two acknowledged psychological instruments, were used to measure participants’ depressive and anxiety symptoms. HAM-D (*Cronbach’s alpha*=0.814) and HAM-A (*Cronbach’s alpha*=0.899) demonstrated good internal consistency in our sample.

#### **Measurement of psychosocial functioning**

Participants’ psychosocial functioning was assessed using the Global Assessment of Functioning (GAF) [25–27], which offers scores ranging from 1 to 100 and can be segmented into ten intervals on a 10-point scale. Scores of 1 to 10 signify the most severe functional impairments, such as persistent risk of serious self-injury. Conversely, scores of 91 to 100 indicate an optimal condition with excellent daily functioning in various aspects of life. In the present study, interval scores of the GAF (e.g., scores 1 to 10 were coded as 1, and scores 11 to 20 were coded as 2) were employed to describe and compare levels of

functioning between groups. A *Cronbach’s alpha* coefficient was not calculated since the GAF consists of only one item. The data on demographic information, anxiety symptoms, depressive symptoms, and psychosocial functioning of participants diagnosed with GAD, BD, and MDD were collected.

#### **Measurement of adverse childhood experiences**

We retrospectively assessed adverse childhood experiences among individuals using the 28-item Childhood Trauma Questionnaire (CTQ) [28]. The CTQ yields five subscales, with scores equal to or above the cutoff point indicating moderate or greater severity of traumatic experiences, thus signifying a positive or significant history of childhood trauma: Emotional Neglect ( $\geq 15$ ), Physical Neglect ( $\geq 10$ ), Emotional Abuse ( $\geq 13$ ), Physical Abuse ( $\geq 10$ ), Sexual Abuse ( $\geq 8$ ) [29, 30]. The CTQ is one of the most widely used instruments and has demonstrated strong psychometric properties across diverse samples [31]. Within our sample, the CTQ demonstrated acceptable internal consistency (*Cronbach’s alpha*=0.747).

#### **Statistical analysis**

Categorical variables are represented in numbers or percentages, and the Chi-square test was used to compare groups. Comparisons between the four diagnostic groups were performed using the Kruskal-Wallis H test for nonparametric tests or the Analysis of Covariance (ANCOVA) for parametric tests and for controlling the potential effects of age and gender. The Kruskal-Wallis H test was also used to compare ranked data. The Friedman test was used to ascertain statistical differences within the same DPD group across distinct symptomatic dimensions. A post-hoc test using Bonferroni’s adjustment method was performed following ANCOVA and the Friedman test. This method was selected for its conservative nature in controlling the family-wise error rate [32]. ANCOVA sample sizes were estimated using *G\*Power* 3.1, suggesting that a minimum sample size of approximately 28 per group could provide a large effect size of 0.4 (power=0.8,  $\alpha$ =0.05, groups=4, covariates=2).

Since some variables in the datasets for the correlation analysis did not strictly conform to a normal distribution by the Shapiro-Wilk test ( $p < .05$ ), Spearman’s rank correlation was used for correlational analysis. A linear regression model was constructed following the results of the correlational analysis to explore how the studied indicators contribute to the current symptom levels. Socio-demographic data (age, gender, education, occupational status, marital status) were incorporated into the regression model to control for their potential effects. Missing values were imputed with the mode (including two missing items in the HAM-A for one MDD patient and one missing item each in the DES for two DPD patients

**Table 1** Socio-demographic information of the participants

Item	DPD	GAD	BD	MDD	Statistical analyses
Age (M, SD)	24.45 (6.28)	33.19 (7.35)	22.97 (6.86)	31.53 (7.24)	$H = 161.27, P < .001^{***}$
Gender (Male/Female, N)	144/73	42/68	86/158	15/60	$\chi^2 = 70.47, P < .001^{***}$
Education					$H = 16.06, P < .01^{**}$
Primary school	0 (0%)	3 (2.73%)	0 (0%)	2 (2.78%)	
Middle or high school	79 (38.35%)	20 (18.18%)	104 (43.15%)	13 (18.06%)	
Junior college	22 (10.68%)	17 (15.45%)	27 (11.20%)	14 (19.44%)	
Undergraduate or above	105 (50.97%)	70 (63.64%)	110 (45.64%)	43 (59.72%)	
Marital status (N, %)					$\chi^2 = 101.47, P < .001^{***}$
Married	22 (14.19%)	63 (57.27%)	42 (17.28%)	34 (46.58%)	
Unmarried	130 (83.87%)	41 (37.27%)	197 (81.07%)	36 (49.32%)	
Divorced	3 (1.94%)	5 (4.55%)	4 (1.65%)	3 (4.11%)	
Widowed	0 (0%)	1 (0.91%)	0 (0%)	0 (0%)	
Occupational status (N, %)					$\chi^2 = 109.03, P < .001^{***}$
Unemployed	13 (9.56%)	16 (14.55%)	37 (15.16%)	5 (8.20%)	
Employed	52 (38.24%)	73 (66.36%)	61 (25.00%)	51 (83.61%)	
Student	71 (52.21%)	21 (19.09%)	146 (59.84%)	5 (8.20%)	

DPD: Depersonalization/derealization disorder. GAD: Generalized anxiety disorder. BD: Bipolar disorder. MDD: Major depressive disorder. *Note* In DPD group, educational background was reported by 206 participants, marital status was reported by 155 participants, occupational status was reported by 136 participants. In BD group, educational background was reported by 241 participants, marital status was reported by 243 participants. In MDD group, educational background was reported by 72 participants, marital status was reported by 73 participants, occupational status was reported by 61 participants

**Table 2** Severity of depersonalized and other dissociative symptoms in DPD

Measure	Mean (SD)	Median [IQR]
CDS Total score	151.54 (57.84)	153.00 [116.00;188.00]
CDS Factor Structure by Sierra et al. (2005)		
Anomalous Body Experience	4.99 (2.61)	4.94 [3.22;7.11]
Emotional Numbing	5.34 (2.65)	5.50 [3.33;7.38]
Anomalous Subjective Recall	4.60 (2.40)	4.60 [3.00;6.25]
Alienation from Surroundings	7.54 (2.14)	7.75 [6.00;9.50]
CDS Factor Structure by Simeon et al. (2008)		
Numbing	4.83 (2.64)	4.67 [2.83;6.83]
Unreality of Self	5.83 (2.73)	6.00 [3.79;8.21]
Perceptual Alterations	3.42 (2.48)	3.20 [1.20;5.20]
Unreality of Surroundings	6.97 (2.84)	6.50 [5.00;10.00]
Temporal Disintegration	5.11 (2.58)	5.00 [3.25;7.00]
DES Mean score	37.87 (19.10)	38.93 [23.21;48.04]
Absorption and Imaginative Involvement	45.15 (21.46)	46.11 [31.94;56.67]
Amnesia	21.95 (20.70)	18.12 [3.75;36.25]
Depersonalization and Derealization	52.30 (23.33)	52.50 [36.25;70.00]

CDS: Cambridge Depersonalization Scale. DES: Dissociative Experiences Scale. *Note* 212 DPD participants completed CDS and 68 participants completed DES

due to improper recording or incomplete responses). A sensitivity analysis was conducted to further ensure the robustness of the results. The analysis included datasets excluding missing values, datasets with mean imputation, and datasets using multiple imputations for missing values. Additionally, different covariates were used in

the between-group comparisons. Detailed methods and results are provided in the supplementary materials.

All analyses employed two-tailed tests, with  $P < .05$  considered statistically significant. Analyses were conducted using R software (version 4.2.1) and SPSS (version 26.0). The results were visualized using GraphPad Prism (version 9.0.0).

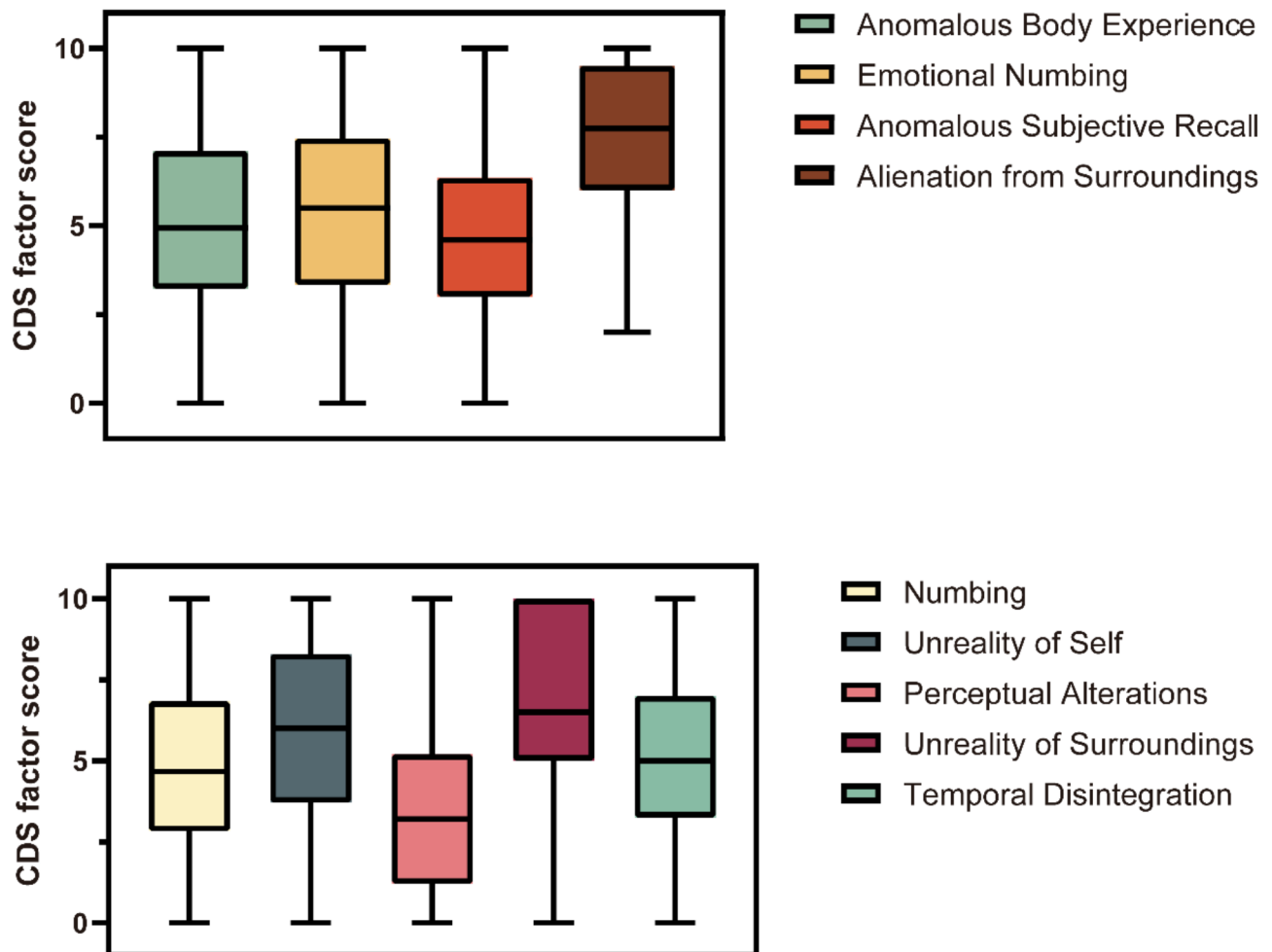
## Results

### Socio-demographic profile

Table 1 shows significant differences between the four groups regarding age, gender proportion, education, marital status, and occupational status.

### Symptom characteristics and functional consequences

The CDS and its derived four- and five-factor structures [15, 16] were used to characterize the symptomatology of DPD, as shown in Table 2. We used means (sum of responses/number of items) to profile DPD participants' responses to each factor. Friedman tests identified statistically significant differences between factor scores within the four-factor and five-factor CDS structures (four-factor structure:  $\chi^2 = 236.98, P < .001^{***}$ ; five-factor structure:  $\chi^2 = 275.87, P < .001^{***}$ ). As shown in Fig. 1, the two factors implying the construct of derealization ("Alienation from Surroundings" and "Unreality of Surroundings") stood out prominently across both structures. Pairwise comparisons (Table 3) corroborated this observation, revealing differences in scores between "Alienation from Surroundings" and "Unreality of Surroundings" compared to other symptom factors.



**Fig. 1** Distribution of mean scores on the four- and five-factor structures of the CDS. CDS: Cambridge Depersonalization Scale. Mean Factor Score = (Total Factor Score/Number of Items). Note 212 DPD participants completed CDS

The severity of other dissociative symptoms is also demonstrated in Table 2; Fig. 2 by presenting the DES mean scores and the mean scores of the subscales. Significant differences emerged between scores on DES subscales ( $\chi^2 = 77.03, P < .001^{***}$ ). In particular, there were differences between the scores of “Amnesia” and “Absorption and Imaginative Involvement,” “Amnesia,” and “Depersonalization and Derealization” after Bonferroni corrections for pairwise comparisons (Table 3).

Table 4; Fig. 3 provide an overview of HAMA, HAMD, and GAF scores for individuals diagnosed with DPD, GAD, BD, and MDD, reflecting the severity of anxiety and depressive symptoms alongside psychosocial functioning levels. Comparative analyses showed significant differences between the four clinical groups in each of the assessments after adjustments for age and sex. Multiple comparisons revealed that participants with DPD experienced less anxiety than participants with GAD ( $MD$  [Mean Difference] = -15.89,  $SE$  [Standard Error]=0.93,  $P < .001^{***}$ ) and MDD ( $MD = -7.80, SE = 1.03, P < .001^{***}$ ),

but more anxiety than participants with BD ( $MD = 3.17, SE = 0.71, P < .001^{***}$ ). The level of depression was lower in DPD than in GAD ( $MD = -7.22, SE = 0.80, P < .001^{***}$ ) and MDD ( $MD = -13.23, SE = 0.89, P < .001^{***}$ ) but comparable to that of BD ( $MD = 0.06, SE = 0.61, P = 1.00$ ). The mean GAF scores evaluated for the DPD group were at the interval of 6, indicating moderate impairments in psychosocial functioning (Hall, 1995). In DPD participants, GAF ratings were notably higher than in MDD participants ( $MD = 0.95, SE = 0.193, P < .001^{***}$ ), while lower than in BD participants ( $MD = -0.61, SE = 0.13, P < .001^{***}$ ). No significant differences were found between DPD and GAD in GAF scores ( $MD = 0.64, SE = 0.27, P = .099$ ).

**Development and course**

Participants were requested to provide substantial details concerning the onset and progression of DPD, including potential precipitating factors or events, the date of onset, and course characteristics. In this study, the



**Table 3** Comparisons between depersonalized and dissociative symptom factors

Factor comparison	<i>P</i> <sup>a</sup>
CDS Four-Factor Structure	
ASR-ABE	0.27
ASR-EN	< 0.01**
ASR-AFS	< 0.001***
ABE-EN	1
ABE-AFS	< 0.001***
EN-AFS	< 0.001***
CDS Five-Factor Structure	
PA-Numb	< 0.001***
PA-TD	< 0.001***
PA-Self	< 0.001***
PA-Surroundings	< 0.001***
Numb-TD	1
Numb-Self	< 0.001***
Numb-Surroundings	< 0.001***
TD-Self	< 0.01**
TD-Surroundings	< 0.001***
Self-Surroundings	< 0.01**
DES Three-Factor Structure	
Amnesia-All	< 0.001***
Amnesia-DpDr	< 0.001***
All-DpDr	0.62

CDS: Cambridge Depersonalization Scale. DES: Dissociative Experiences Scale. ASR: Anomalous Subjective Recall. AB: Anomalous Body Experience. EN: Emotional Numbing. AFS: Alienation from Surroundings. PA: Perceptual Alterations. Numb: Numbing. TD: Temporal Disintegration. Self: Unreality of Self. Surroundings: Unreality of Surroundings. All: Absorption and Imaginative Involvement. DpDr: Depersonalization and Derealization

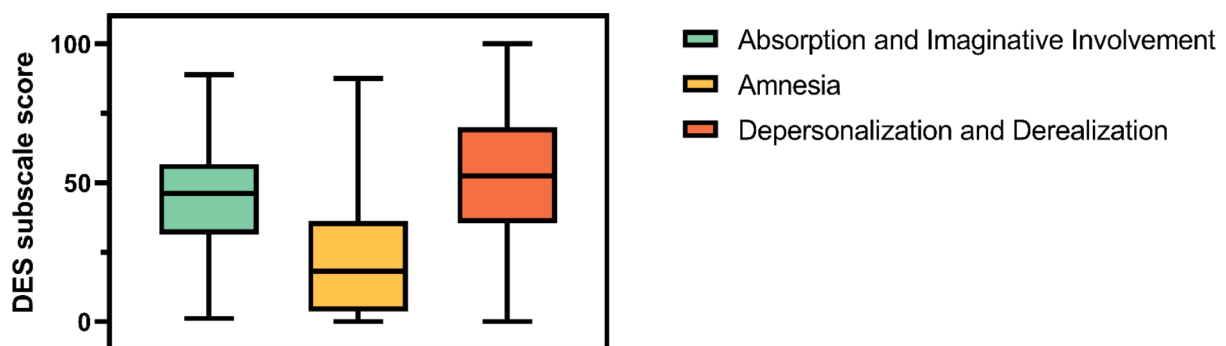
<sup>a</sup> Adjusted by the Bonferroni correction for multiple tests

calculated age of DPD onset was 18.20±6.11 years. Seventeen DPD participants could not recall or were not queried about the onset date, consequently precluding the calculation of onset age.

Among 150 participants interviewed about the precipitants for the onset of DPD, 91 (60.67%) reported relevant events or factors, while 59 (39.33%) could not identify an apparent trigger. As depicted in Table 5, “family factors or events” (*N*=22) and “academic or occupational stress” (*N*=19) were the most commonly reported precipitants. Family factors involved, for example, quarrels with family members, death of a family member, and separation from family members, while instances of “academic or occupational stress” included chronic stress from academic or occupational responsibilities. These were followed by “anxiety” (*N*=13; e.g., excessive worry or nervousness, panic attacks), “medical or physical-related triggers” (*N*=12; e.g., surgery, allergies, pharmaceuticals, fever, injuries), and “interpersonal factors or events” (*N*=12; e.g., fractured social relationships, bullying). “Acute stress” (*N*=3) in the present study refers to the response elicited by exposure to a brief, perceived threatening stimulus, such as being startled by an abrupt, intense, and unexpected auditory stimulus. In addition, 147 participants reported course characteristics of DPD, with 136 (92.52%) experiencing symptoms as persistent, whereas only 11 (7.48%) experiencing symptoms as intermittent, suggesting a tendency for DPD symptoms to be stably present.

**Treatment history**

DPD participants were queried regarding their medical history, including the “date of the first healthcare visit with DPD complaints,” “date of the first DPD diagnosis,” and “previous diagnoses.” In the current study, the duration of delayed healthcare visit (duration from DPD onset to the first healthcare visit) for DPD participants was 3.21±4.42 years, and the duration of delayed diagnosis (duration from first healthcare visit to first DPD diagnosis) was 3.05±4.53 years. Further analysis



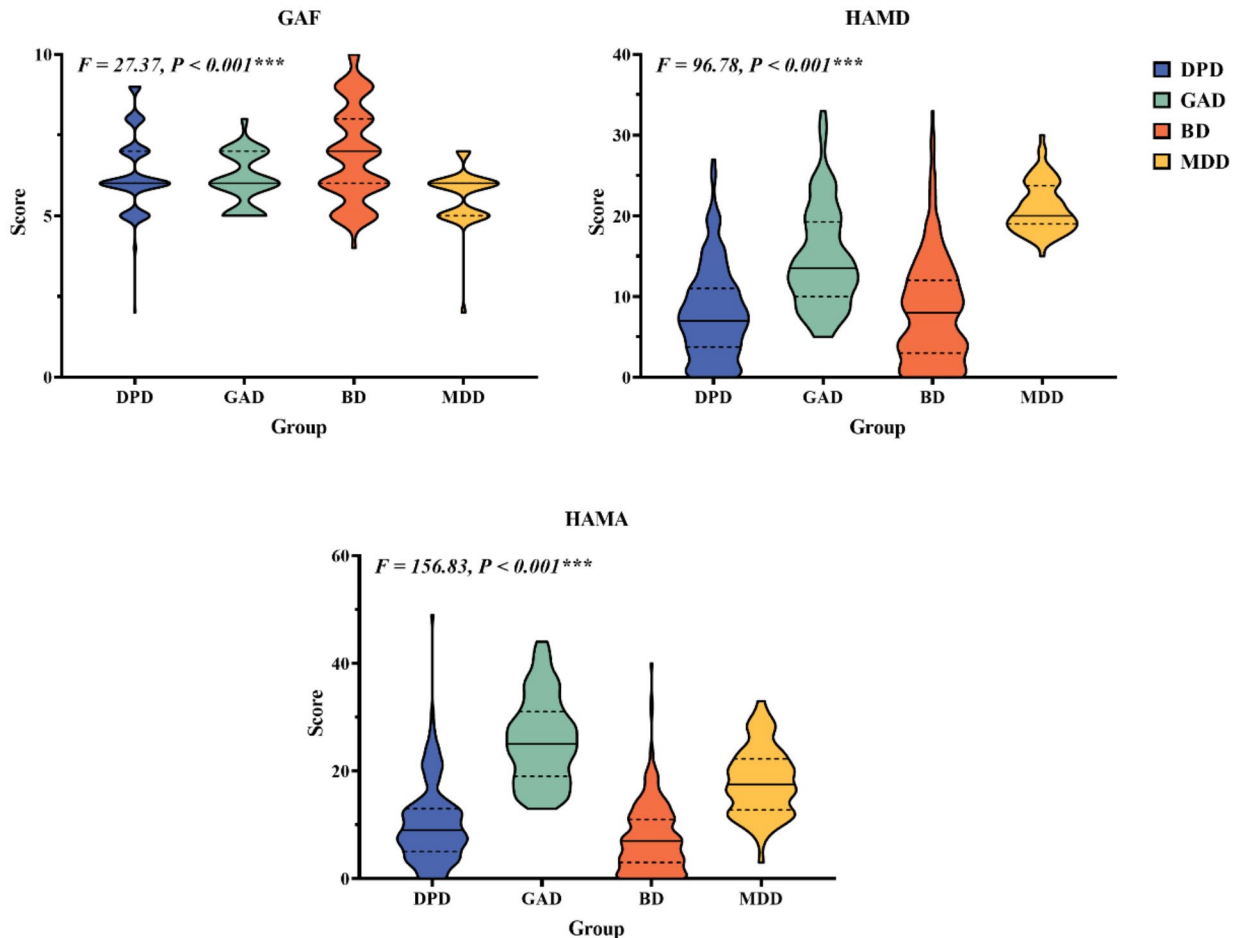
**Fig. 2** Distribution of mean scores on the 3 subscales of the DES. DES: Dissociative Experiences Scale. Mean Subscale Score = (Total Subscale Score/ Number of Items). Note 68 DPD participants completed DES

**Table 4** Between-group comparisons in anxiety, depressive symptoms, and psychosocial functioning

Measures	DPD	GAD	BD	MDD	F	P
HAMA	10.25 (7.33)	25.84 (7.85)	7.54 (6.37)	18.08 (6.28)	156.83	< 0.001***
HAMD	7.97 (5.71)	14.72 (6.20)	8.25 (6.55)	21.00 (3.09)	96.78	< 0.001***
GAF	6.38 (1.20)	6.10 (0.83)	6.89 (1.48)	5.61 (0.87)	27.37	< 0.001***

DPD: Depersonalization/derealization disorder. GAD: Generalized anxiety disorder. BD: Bipolar disorder. MDD: Major depressive disorder. HAMA: Hamilton Rating Scale for Anxiety. HAMD: Hamilton Rating Scale for Depression. GAF: Global Assessment of Functioning

Note In the DPD group, HAMA was administered to 181 participants, HAMD to 178 participants, and GAF to 165 participants. In the GAD group, GAF was administered to 31 participants. In the BD group, GAF was administered to 238 participants. In the MDD group, HAMA was administered to 74 participants, HAMD to 72 participants



**Fig. 3** Psychosocial functioning, depressive symptoms, and anxiety symptoms in participants with DPD, GAD, BD, and MDD. DPD: Depersonalization/derealization disorder. GAD: Generalized anxiety disorder. BD: Bipolar disorder. MDD: Major depressive disorder. HAMA: Hamilton Rating Scale for Anxiety. HAMD: Hamilton Rating Scale for Depression. GAF: Global Assessment of Functioning

showed significant correlations between longer “duration of delayed healthcare visit” and more severe CDS symptomatic dimensions of “Temporal Disintegration” ( $r=.25, P<.05^*, N=80$ ) and “Anomalous Subjective Recall” ( $r=.25, P<.05^*, N=80$ ). A positive association emerged between the “duration of delayed healthcare visit” and HAMA scores ( $r=.23, P<.05^*, N=77$ ), indicative of elevated anxiety.

As presented in Table 6, the multiple regression model showed that the “duration of delayed healthcare visit” predicted the current “Anomalous Subjective Recall,” controlling for the potential effects of socio-demographic metrics. Diagnostics of the regression model are shown in Supplementary Fig. 1 in the supplementary materials. Note that the “duration of delayed healthcare visit” can be calculated for 82 participants and the “duration of delayed diagnosis” for 78 participants. However, due

**Table 5** Potential precipitating factors or events for the onset of DPD

Precipitants	N (%)
None	59 (39.33%)
Family factors or events	22 (14.67%)
Academic or occupational stress	19 (12.67%)
Anxiety	13 (8.67%)
Medical events or Physical factors	12 (8.00%)
Interpersonal factor or events	12 (8.00%)
Sleep deprivation/Insomnia	9 (6.00%)
Alcohol use	5 (3.33%)
Acute stress	3 (2.00%)
Depression	2 (1.33%)
Fatigue	1 (0.67%)
Other	6 (4.00%)

**Table 6** Duration of delayed healthcare visit predicting current 'anomalous subjective recall' (N = 60)

Predictors for 'anomalous subjective recall'	Estimate	95% CI	P
Duration of delayed healthcare visit	0.14	0, 0.27	$P < .05^*$
Age	0.01	-0.16, 0.18	$P = .90$
Gender	-0.02	-1.24, 1.2	$P = .98$
Education	-0.20	-0.91, 0.5	$P = .56$
Occupational status	-0.01	-1.23, 1.22	$P = .99$
Marital status	-0.90	-3.01, 1.22	$P = .39$

**Table 7** Prior psychiatric diagnosis of participants with DPD

Diagnosis	N%
Anxiety disorders	28 (56.00%)
Depressive disorders	27 (54.00%)
Bipolar disorders	8 (16.00%)
Obsessive-compulsive disorder	6 (12.00%)
Insomnia disorders	4 (8.00%)
Neurasthenia	3 (6.00%)
Somatization disorders	2 (4.00%)
Neurotic disorders	1 (2.00%)
Conversion disorder	1 (2.00%)
Sleep paralysis	1 (2.00%)

Note 50 participants reported previous diagnoses

**Table 8** Adverse childhood experiences of DPD participants

CTQ subscale	Mean (SD)	Positive N%
CTQ total score	51.11 (10.35)	—
Emotional Neglect	13.09 (4.78)	57 (37.75%)
Physical Neglect	8.68 (3.04)	53 (35.10%)
Emotional Abuse	8.71 (4.00)	20 (13.25%)
Physical Abuse	6.50 (2.90)	14 (9.27%)
Sexual Abuse	5.56 (1.78)	10 (6.62%)

CTQ: Childhood Trauma Questionnaire. Positive N%: Number and percentage of participants scoring at or above the cutoff points for the CTQ subscales. Note 151 DPD participants completed the CTQ

to incomplete data for some variables in the regression model, the final sample size for the regression analysis reported in Table 6 is 60 participants.

Previous psychiatric diagnoses reported by the participants with DPD are documented in Table 7, with the three most frequent diagnoses being anxiety disorders ( $N=28$ ), depressive disorders ( $N=27$ ), and bipolar disorders ( $N=8$ ).

### Adverse childhood experiences

Childhood maltreatment or trauma was assessed using the CTQ. As shown in Table 8, the percentages of participants reporting moderate or higher levels (positive or significant levels) of adverse childhood experiences were as follows: 37.75% for emotional neglect, 35.10% for physical neglect, 13.25% for emotional abuse, 9.27% for physical abuse, and 6.62% for sexual abuse. Subsequent correlational analyses provide further information on the relationships between adverse childhood experiences and DPD symptomatology. Positive correlations were observed between the CTQ total scores and the CDS total scores ( $r=.18$ ,  $P<.05^*$ ,  $N=149$ ), and mean CDS factor scores for "Perceptual Alterations" ( $r=.19$ ,  $P<.05^*$ ,  $N=149$ ), "Temporal Disintegration" ( $r=.19$ ,  $P<.05^*$ ,  $N=149$ ), and "Alienation from Surroundings" ( $r=.20$ ,  $P<.05^*$ ,  $N=149$ ).

### Discussion

This study presents the first comprehensive analysis of the clinical characteristics of a large Chinese cohort diagnosed with DPD to better understand this disorder. A broad spectrum of critical clinical data was examined, encompassing demographic and sociological information, symptom characteristics, functional capacity, course and progression, history of healthcare, and adverse childhood experiences. Although variations emerged when compared to investigations in Western contexts, the findings consistently underscore the significant yet often overlooked nature of DPD.

The average age of participants with DPD was approximately 25 years during their initial visit to our outpatient clinic. Notably, the proportion of males with DPD significantly outnumbered females, with an approximate ratio of 2:1. This finding contrasts markedly with results obtained from the US, Germany, and the UK, where the male-to-female ratio among consecutive participants was close to 1:1, despite the number of males being slightly higher [7, 8, 10]. Although there are currently no satisfactory explanations for the relative predominance of males found in consecutive cases with DPD in China compared to Western contexts, several factors may have influenced this finding. For example, it was found that when confronted with emotionally arousing stimuli, Chinese males seemed to favor a disengagement strategy (especially



distancing, such as mentally separating oneself from the current emotional situation) as a response, and this strategy was also associated with lower emotional intensity [33]. Given that depersonalization is characterized by a sense of detachment from self-experience, difficulty engaging with immediate reality, and numbness when exposed to emotional situations, a high propensity for this coping strategy may imply a higher risk of depersonalization among Chinese males. The observed discrepancies in sex ratios deserve thorough investigations, including samples from both China and other countries.

The symptomatology profile of CDS suggests that individuals with DPD may perceive symptoms associated with “derealization” as more frequent or persistent compared to other symptomatic dimensions. This observation is exemplified through the mean scores of the CDS factors “Alienation from Surroundings” and “Unreality of Surroundings,” which depict an experience of “being cut off from the world and things around seeming unreal.” These symptoms are commonly reported as the surroundings being “visually blurred, as if looking through mist or frosted glass.” Therefore, the prominence of “derealization” could be attributed to the properties of vision as one of the primary sensory modalities and sources of information [34, 35]. Consequently, an “unreal” visual experience may be perceived more frequently or persistently.

Additionally, the mean DES score for Chinese participants with DPD was 37.87, higher than the mean score of 23.84 reported by Baker et al. [8]. This discrepancy might be partially attributed to differences in demographic or chronological backgrounds between studies. For example, the DPD participants in the present study were younger than those in the study by Baker et al. [8] (mean age 25 years vs. 36 years), potentially indicating an elevated susceptibility to dissociation [36]. Nevertheless, empirical studies have revealed that the general population in China reported fewer dissociative symptoms than those from Western backgrounds (Canadians or Chinese-Americans) [37, 38]. This contrasts with our findings, highlighting the need for robust study designs to uncover the differences in dissociative symptoms between DPD participants in China and Western countries.

Consistent with previous studies, we identified noteworthy anxiety (HAMA) and depressive (HAMD) symptoms, as well as impairments in psychosocial functioning (GAF), in DPD participants. Overall, the current study showed that levels of anxiety and depression were less severe in DPD than in GAD and MDD. However, DPD participants exhibited higher levels of anxiety and comparable levels of depression to BD participants. Moreover, the psychosocial functioning of DPD participants was superior to MDD participants but was inferior to BD participants and was comparable to GAD participants.

The mean GAF ratings for participants with DPD were in the range of 51–60, indicating moderate difficulties in social, academic, and occupational functioning [27]. We postulate that lower anxiety and comparable depression in BD compared to DPD may be attributable to certain BD participants being in manic or hypomanic states during assessment, leading to reduced anxiety or depression. Nevertheless, the anxiety and depression experienced by DPD participants still warrant emphasis due to the high comorbidity with anxiety and depressive disorders [1, 7, 10]. Factors associated with the impairment of social functioning in DPD patients, such as cognitive functioning and symptom severity, should be further explored in future studies.

In alignment with general understanding, our study also found the early-onset nature of DPD in Chinese participants (age of onset:  $18.20 \pm 6.11$  years). This is consistent with the common recognition that DPD usually occurs before the age of 25 [4, 7]. Concerning etiological precipitants, Chinese individuals with DPD tended to report “family factors or events,” “anxiety,” and “academic or occupational stress” as the primary precipitants. In contrast, participants in the study conducted in the US [10] tended to attribute drug-related factors (e.g., marijuana ingestion, hallucinogenic ingestion) as precipitants for the disorder. This observed discrepancy could be explained by varying national regulations governing drug utilization [39, 40], resulting in different levels of drug accessibility across countries. It would also be valuable to study the association between these precipitating factors and the diagnosis of DPD through more rigorous study designs.

Investigations of delays in seeking therapy and diagnosis among participants with DPD highlight the need for heightened attention to this disorder. In the present investigation, participants typically took around three years after the onset of DPD to seek professional help and another three years to secure an accurate diagnosis. Many of our patients reported delays in seeking medical attention due to a lack of awareness about DPD during its initial stages. They may misattribute these symptoms to temporary stress, mood fluctuations, sleep disturbances, or even consider the feelings of unreality as normal experiences that everyone shares. It is also challenging for patients to receive concern from parents or guardians, even if the patients realize the pathological nature of these experiences.

Longer durations of delayed healthcare attendance were found to be correlated with increased DPD symptom severity, particularly symptoms of anomalous memory or temporal experiences (“Temporal Disintegration,” “Anomalous Subjective Recall”), often characterized by a feeling of detachment or unfamiliarity about one’s memories, or déjà vu [15, 16]. Furthermore, the duration

of delayed healthcare attendance was predictive of the current severity of “Anomalous Subjective Recall” even after controlling for the effects of socio-demographic factors. We tentatively hypothesized that these associations may partly stem from the fact that a longer period of delayed healthcare-seeking implies an extended course of unremitting DPD. Notably, a number of our participants reported that they experienced feelings of unfamiliarity and detachment only when recalling experiences that occurred after the onset of DPD, while memories of events before the onset did not evoke such feelings. Thus, an extended duration of unremitting DPD may result in more “unreal” experiences being encoded into the memory system. Further investigation into this phenomenon through rigorous empirical designs is necessary.

Our observations suggest that participants frequently received diagnoses of anxiety and depressive disorders before consulting our outpatient clinic, possibly reflecting the high comorbidity between these disorders and the potential for misdiagnosis of DPD as anxiety or depression. This, coupled with the considerable delays in diagnosis, indicates a potential knowledge gap regarding DPD among clinical practitioners. However, the level of diagnostic and therapeutic expertise of clinicians regarding DPD has not been determined through direct surveys of the clinician population.

Similar to the findings of Michal et al. [7], our study revealed very limited childhood adversities among consecutive DPD participants in China, with only 35.10–37.75% of participants reporting childhood neglect and even fewer (6.62–13.25%) reporting childhood abuse. Nonetheless, we identified significant correlations between negative childhood experiences and current DPD symptom severity. To date, empirical evidence on childhood trauma as a potential etiological factor for DPD has been mixed [7, 41, 42]. Psychological theories of DPD etiology have emphasized the role of mental escape from trauma during childhood [4, 7]. However, empirical studies [42–44] are more consistent in suggesting noteworthy associations between childhood adversities and the severity of DPD symptoms. For example, depersonalized symptoms may play a mediating role between childhood trauma and psychological distress [44]. The causal relationship between childhood trauma and the incidence of DPD in the Chinese population warrants further investigation.

### Limitations

This study has several limitations that deserve attention. First, not all participants reported the indicators analyzed in the study, which may lead to variations in analytical effectiveness. Second, confounding factors such as social desirability were not strictly controlled for in the study. This bias could lead to an underestimation of the severity

of DPD symptoms and an inaccurate representation of the precipitating factors. Future studies should incorporate measures to assess and control for social desirability bias. Third, despite the exclusion of DPD diagnosis, the GAD, BD, and MDD groups did not strictly exclude participants with accompanying temporary depersonalized experiences. This inclusion could have compromised the power of comparative analyses to some extent. The examination of overlaps and differences between DPD and other mental disorders could be enhanced in future studies by strictly excluding any participants who have accompanying depersonalized experiences, enlarging the sample size, and enrolling other diagnostic groups.

### Conclusions

This study presents the first comprehensive analysis of the clinical characteristics of DPD in a Chinese cohort, revealing its early-onset characteristics, specific patterns of depersonalized and dissociative symptomatology, noteworthy functional impairments, potential susceptibility to misdiagnosis, and alarming delays in seeking healthcare and diagnosis. The findings generally support the recognition that DPD is a serious but often neglected mental disorder. Collaborative attention from both the public and medical professionals is essential. Three preliminary appeals can be raised: (1) the necessity for increased public health education and professional training on DPD, (2) the necessity for developing consensus clinical guidelines and self-help manuals in China, and (3) the necessity for further exploration of effective therapeutic approaches for DPD.

### Abbreviations

ANCOVA	Analysis of covariance
BD	Bipolar disorder
CDS	Cambridge depersonalization scale
DES	Dissociative experiences scale
DPD	Depersonalization/derealization disorder
GAD	Generalized anxiety disorder
GAF	Global assessment of functioning
HAMD	Hamilton rating scale for depression
HAMA	Hamilton rating scale for anxiety
MDD	Major depressive disorder
US	United States
UK	United Kingdom

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12888-024-06028-z>.

Supplementary Material 1

### Author contributions

Mingkang Song conducted data collection, statistical analysis, and manuscript writing. Sisi Zheng collected the data, interpreted it, and contributed to the manuscript's writing. Nan Song collected and interpreted the data. Hong Zhu provided expertise and assisted with data acquisition. Yuan jia collected the data and edited the manuscript. Zhiqing Dai, Xinzi Liu, Ziyao Wu and Yuhang Duan contributed to the data collection. Zhiyuan Huang contributed

to the writing of the manuscript. Jindong Chen conducted the conception and design, manuscript review, and final approval for publication. Hongxiao Jia conducted the conception and design, acquisition of data, review of the manuscript, final approval for publication.

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### Data availability

The data supporting this study's findings are available from the corresponding authors upon reasonable request.

### Declarations

#### Ethics approval and consent to participate

The study received approval from the Ethical Committee of Beijing Anding Hospital, Capital Medical University, China (No. 2020-17). Informed consent was obtained from adult participants aged 18 and above. For minor participants under the age of 18, informed consent was obtained from both themselves and their parents or legal guardians.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare no competing interests.

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