Perceived Isolation in Self-Compassion Scale as a Subtyping Marker for Severe Anorexia Nervosa

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Article

Perceived Isolation in Self-Compassion Scale as a Subtyping Marker for Severe Anorexia Nervosa

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Abstract

This study aimed to examine the differences in self-compassion (SC) subcomponents between anorexia nervosa (AN) subtypes, restricting type (ANR) and binge-eating/purging type (ANBP), with a focus on perceived isolation and self-judgment. This retrospective exploratory study included 40 patients with AN at a Japanese tertiary hospital. The participants completed the Self-Compassion Scale, Patient Health Questionnaire-9, and Eating Disorder Examination Questionnaire. Between-group comparisons were conducted using t-tests, and logistic regression was used to identify predictors of the AN subtype. The ANBP group was older at the time of assessment and had longer illness duration than the ANR group. They also showed significantly more depressive symptoms, more severe eating pathologies, and lower SC scores. Specifically, patients with ANBP had significantly lower scores on the self-judgment and isolation subscales. Logistic regression showed that higher isolation scores predicted ANBP subtype (odds ratio = 4.50, 95% confidence interval: 1.40–25.0, p = 0.0086), independent of depression and eating symptoms. Perceived isolation is more prominent in ANBP and may reflect the affective and interpersonal dysfunction characteristics of this subtype. Targeting these SC dimensions may be important for the development of subtype-specific interventions. Compassion-based approaches offer therapeutic benefits, particularly for individuals with purging behaviors.

Keywords: self-compassion; anorexia nervosa restricting type; anorexia nervosa binge eating/purging type

1. Introduction

Anorexia nervosa (AN) is a severe and multifactorial psychiatric disorder characterized by intense fear of weight gain, persistent dietary restriction, and distorted perception of body image. According to the DSM-5, AN can be divided into two major subtypes: the restricting type (ANR), in which individuals maintain a low body weight primarily through caloric restriction and excessive exercise, and the binge-eating/purging type (ANBP), in which individuals engage in recurrent episodes of binge eating or purging behaviors. In Japan, eating disorders have been increasing since the 1970s, and it has been pointed out that restrictive eating disorders have gradually become more prolonged and spread to people in their 30s to 50s [1]. However, cases of binge eating disorders have increased since the 1980s [2]. Regarding the physical aspects, AN is also associated with the highest mortality rate among psychiatric conditions [3]. While both subtypes are associated with significant physical and psychological morbidity, ANBP is often linked to more severe symptomatology, including greater emotional dysregulation, impulsivity, and higher rates of psychiatric comorbidities, such as mood and substance use disorders [4].

Recent studies have reported low levels of self-compassion (SC) in individuals with eating disorders [5]. SC is defined as the practice of extending kindness, understanding, and nonjudgmental awareness of oneself during times of failure or distress [6]. Neff's SC model proposes three core components: self-kindness, common humanity, and mindfulness [6]. Self-kindness involves treating

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oneself with warmth and support rather than harsh criticism. Common humanity recognizes that suffering and imperfection are universal aspects of the human experience, and mindfulness refers to being aware of present-moment experiences in a balanced and non-reactive way. Together, these elements form a framework that enables individuals to respond to personal challenges through resilience and psychological flexibility.

Paul Gilbert's evolutionary theory complements Neff's model by emphasizing compassion as an emotion regulation system developed to alleviate distress and promote social affiliation. This model highlights six key components: sensitivity to suffering, sympathetic concern, empathic understanding, motivation for care, distress tolerance, and non-judgment [7]. The integration of these elements provides a comprehensive understanding of how SC can be fostered and applied in clinical settings.

Within the context of eating disorders, SC serves as an adaptive emotion regulation strategy that contrasts sharply with maladaptive coping mechanisms often used by individuals with AN, such as restriction, binging, or purging. These behaviors are frequently employed to avoid or suppress painful emotions. In contrast, SC encourages the acknowledgment and acceptance of difficult feelings without judgment, fostering more constructive engagement with emotional distress [8].

Despite the availability of evidence-based treatments for AN, including cognitive behavioral and family based therapies, long-term outcomes remain suboptimal. Studies estimate that only 45–70% of patients achieve full remission, and relapse rates range between 9 and 52% and tend to increase with increasing duration of follow-up [9,10]. ANBP is associated with impulsivity, risk-taking behavior, and a frequent diagnostic crossover with bulimia nervosa [11]. These complexities highlight a critical gap in the current treatment modalities, particularly in addressing the affective and self-related dimensions of the disorder.

Interventions aimed at enhancing SC, such as compassion-focused therapy or mindful SC training, have shown promising results in reducing eating disorders and improving emotional resilience [12–14]. SC may act as a buffer against specific psychological risk factors commonly implicated in the pathology of eating disorders. For example, shame, a deeply painful emotion that is often rooted in perceived social inferiority or failure, is strongly associated with disordered eating [7]. Individuals with high SC are better able to cope with shame-related experiences, thus reducing their reliance on maladaptive eating behaviors [5].

Several recent studies have discussed eating psychopathology and the relationship between eating disorders and SC in profound detail [15]. However, analyses on subtypes based on clinical samples is lacking [5]. Recent studies have highlighted the dynamic role of SC in daily emotional functioning. A daily diary study revealed that higher levels of SC were associated with more frequent use of adaptive coping strategies, lower levels of body dissatisfaction, and disordered eating symptoms [16]. Nonetheless, most existing research has treated SC as a unitary construct, with limited attention paid to its individual components. Furthermore, previous studies have seldom examined how SC varies across AN diagnostic subtypes in clinical populations. The specific psychological profiles of ANR and ANBP suggest that the internal experiences associated with SC may differ between subtypes. However, this remains unclear in the current literature.

In this context, we hypothesized that, while individuals with AN may generally exhibit reduced SC, the specific subcomponents of SC, such as perceived isolation, might differ meaningfully between subtypes. Clarifying these distinctions may contribute to a more precise psychological formulation and inform the development of subtype-specific therapeutic strategies. Therefore, in the present study, we aimed to investigate the relationship between SC subcomponents and AN subtypes among Japanese clinical patients, with a particular focus on the "Isolation" dimension.

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2. Materials and Methods

2.1. Study Design

A retrospective exploratory study was conducted at a single tertiary hospital.

2.2. Participants

Patients diagnosed with AN who visited the Department of Neuropsychiatry at Hokkaido University Hospital between January 1, 2010, and January 31, 2025, were included.

2.3. Inclusion and Exclusion Criteria

The inclusion criteria were (1) meeting the DSM-5 criteria for AN (ANR or ANBP); (2) age between 18 and 60 years at the time of diagnosis; and (3) availability of complete data on the Self-Compassion Scale (SCS), Patient Health Questionnaire-9 (PHQ-9), and Eating Disorder Examination Questionnaire (EDE-Q). The exclusion criteria were: (1) failure to meet the DSM-5 criteria, (2) severe cognitive impairment that hindered questionnaire completion, and (3) missing key data.

2.4. Measures

2.4.1. PHQ-9

This widely used 9-item self-report measure assesses the presence and severity of depressive symptoms over the past 2 weeks [17]. It is commonly used in clinical and research settings to screen for major depressive disorders and monitor treatment responses. We used the Japanese version of the PHQ-9, which has a high validity in primary care [18] and psychiatric settings [19].

2.4.2. EDE-Q 6.0

A 28-item self-report instrument was designed to evaluate the core cognitive and behavioral features of eating disorders in the previous 4 weeks, including restraint, eating concern, shape concern, and weight concern. It is based on a structured EDE interview and provides subscales and global scores [20,21].

2.4.3. SCS

This 26-item measure was developed by Neff to assess how individuals relate to themselves during times of difficulty. It evaluates six subcomponents of SC: self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification [22]. Higher scores indicate greater SC. We used the Japanese version of the SCS [23].

2.5. Ethical Considerations

The retrospective study was approved by the Institutional Review Board of Hokkaido University Hospital. The need for informed consent was waived and authorized an opt-out approach in accordance with the ethical guidelines for medical and health research involving human participants [24].

2.6. Statistical Analysis

Demographic data, PHQ-9 summary scores, EDE-Q 6.0 score, and SCS scores were compared between the ANR and ANBP groups using t-tests. We then conducted a logistic regression analysis using the AN subtype (ANR = 0, ANBP = 1) as the dependent variable to adjust for confounding factors. The independent variables included age at assessment, PHQ-9 summary score, EDE-Q global score, and SCS-Isolation score. Odds ratios (OR), 95% confidence intervals (CI), and p-values were reported, and analyses were performed using JMP 18.2.1, with a significance level of $p < 0.05$.

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3. Results

Forty participants diagnosed with AN, comprising 25 with ANR and 15 with ANBP, were included in the study. Only one male participant was included in the ANR group. The mean age of patients in the ANBP group at the first visit was 30.9 ± 13.2 years, which was significantly older than those in the ANR group. Additionally, the period from onset to the first visit was more than twice as long in the ANBP group than in the ANR group. The overall mean body mass index (BMI) was 16.0 ± 3.43, with no significant difference observed between subtypes (Table 1).

Table 1. Demographic data.

	Total		**ANR**		**ANBP**		**Statistic**	**p-value**
N (Female/Male)	40 (39/1)		25 (24/1)		15 (15/0)			
Variable	mean	(SD)	mean	(SD)	mean	(SD)		
Age of onset (y.o.)	20.9	(8.18)	19.9	(6.08)	22.5	(10.9)	-0.867	0.327
Age at the first visit (y.o.)	26.2	(11.1)	23.4	(8.74)	30.9	(13.2)	-1.983	0.035
Age at the assessment (y.o.)	30.1	(13.2)	26.6	(11.4)	35.9	(14.4)	-2.139	0.029
Height (m)	1.57	(0.06)	1.57	(0.06)	1.57	(0.06)	0.086	0.933
Weight at the first visit (kg)	34.8	(5.80)	34.5	(5.65)	35.2	(6.24)	-0.335	0.733
Weight at the assessment (kg)	39.4	(7.99)	39.8	(7.64)	38.7	(8.78)	0.421	0.665
BMI at the first visit (kg/m^2)	14.1	(2.12)	13.9	(2.03)	14.2	(2.34)	-0.429	0.659
BMI at the assessment (kg/m^2)	16.0	(3.43)	16.2	(3.55)	15.7	(3.32)	0.485	0.636
Period from onset to the first visit (month)	64.6	(75.3)	42.9	(53.8)	101	(92.6)	-2.206	0.017
Period from onset to the assessment (month)	113	(109)	84.6	(94.7)	159	(119)	-2.073	0.034
Comorbidity (%)	4.22	(10.0)	1.00	(4.00)	3.00	(20.0)	1.185	0.276

Abbreviations: AN, anorexia nervosa; ANR, anorexia nervosa restrictive type; ANBP, Anorexia Nervosa Binge-eating/Purging type; BMI, Body Mass Index.

The PHQ-9 summary score in the ANBP group was 15.5 ± 7.40, indicating a severe level, which was significantly higher than that in the ANR group (7.80 ± 6.12). The average EDE-Q 6.0 score in the ANBP group was significantly higher than that in the ANR group. For the EDE-Q 6.0, the ANBP group scored significantly higher on all subscales, with particularly large differences on the weight concern subscale. The total SCS score in the ANBP group was significantly lower than that in the ANR group. Regarding the SCS subscale, the ANBP group scored significantly lower on the self-judgement and isolation subscales (Table 2).

Table 2. Scores of assessment scales for clinical symptoms.

Variables	**Total**		**ANR**		**ANBP**		**t-value**	**p-value**
	mean	(SD)	mean	(SD)	mean	(SD)		
PHQ-9 summary score	10.7	(7.56)	7.80	(6.12)	15.5	(7.40)	3.58	0.001
EDE-Q 6.0								
Restraint	1.96	(1.76)	1.50	(1.49)	2.72	(1.94)	2.241	0.031
Eating_Concern	1.96	(1.67)	1.50	(1.47)	2.71	(1.76)	2.331	0.025
Weight_Concern	2.25	(1.78)	1.73	(1.56)	3.11	(1.84)	2.530	0.016
Shape_Concern	2.65	(1.79)	2.08	(1.61)	3.59	(1.71)	2.800	0.008
EDE-Q 6.0_average	2.20	(1.56)	1.70	(1.32)	3.03	(1.61)	2.837	0.007
SCS								
Self_Kindness	2.36	(0.96)	2.62	(1.00)	1.92	(0.75)	-2.335	0.025
Self_Judgment	3.65	(0.90)	3.35	(0.89)	4.15	(0.68)	2.966	0.005

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Common_Humanity	2.50	(0.95)	2.66	(0.92)	2.23	(0.97)	-1.393	0.172
Isolation	2.84	(0.97)	2.45	(0.78)	3.50	(0.92)	3.868	<0.001
Mindfulness	2.55	(0.92)	2.68	(0.93)	2.33	(0.90)	-1.159	0.254
Over_Identification	3.60	(1.02)	3.36	(1.00)	4.0	(0.94)	2.000	0.053
SCS_Total score	15.3	(4.32)	16.8	(4.11)	12.8	(3.56)	-3.092	0.004

Abbreviations: SCS, Self-Compassion Scale; PHQ-9, Patient Health Questionnaire; EDE-Q, Eating Disorder Examination Questionnaire; BMI, Body Mass Index; SD: Standard Deviation.

Higher SCS-isolation scores were significantly associated with the ANBP subtype (OR =4.89, 95% CI [1.45–28.4], p = 0.029), even after adjusting for other variables. In contrast, neither the EDE-Q average score (p = 0.377) nor the PHQ-9 summary score (p = 0.191) showed significant associations (Table 3).

Table 3. Logistic regression analysis for anorexia nervosa binge-eating/purging type.

	B	**SE**	**Chi-square**	**P-value**	**OR**	**95% C.I.**	
						lower	upper
Age at the first visit	0.07	0.04	2.61	0.11	1.07	0.99	1.17
EDE-Q 6.0 average score	0.30	0.34	0.80	0.37	1.36	0.69	2.77
PHQ-9 summary score	0.08	0.07	1.57	0.21	1.09	0.96	1.25
SCS total score	-0.20	0.15	1.83	0.18	0.82	0.59	1.07
Age at the first visit	0.07	0.04	2.78	0.10	1.07	0.99	1.17
EDE-Q 6.0 average score	0.29	0.36	0.67	0.41	1.34	0.66	2.80
PHQ-9 summary score	0.08	0.07	1.40	0.23	1.09	0.95	1.26
SCS Self Judgement	0.74	0.68	1.17	0.28	2.09	0.61	9.82
Age at the first visit	0.10	0.05	3.37	0.07	1.10	1.00	1.25
EDE-Q 6.0 average score	0.37	0.38	0.78	0.38	1.40	0.67	3.15
PHQ-9 summary score	0.09	0.07	1.71	0.19	1.10	0.96	1.28
SCS Isolation	1.59	0.73	4.77	0.03	4.89	1.45	28.4

Abbreviations: EDE-Q, Eating Disorder Examination Questionnaire; PHQ-9, Patient Health Questionnaire; SCS, Self-Compassion Scale; SE: Standard Error; OR, Odds Ratio.

4. Discussion

This study identified perceived isolation and older age as significant predictors of ANBP in a Japanese clinical sample. The SCS isolation subscale, which reflects the absence of perceived common humanity and an enhanced sense of disconnection from others, was significantly associated with the ANBP subtype. These findings are consistent with prior literature suggesting that interpersonal and emotional difficulties, particularly feelings of shame and alienation, may play a central role in the maintenance and differentiation of eating disorder presentations [6,11,24].

While both AN subtypes involve restrictive eating behaviors, ANBP has been more consistently associated with impulsivity, affective instability, and greater comorbidity with mood and personality disorders [4,8]. Elevated levels of perceived isolation in individuals with ANBP may reflect chronic emotional dysregulation and interpersonal withdrawal, which may further perpetuate maladaptive behaviors such as binge eating and purging. Since SC buffers shame and promotes adaptive emotion regulation [6,12], these findings underscore the therapeutic potential of targeting this construct, particularly in individuals with ANBP.

Notably, depressive symptom severity and global eating pathology, as measured by the PHQ-9 and EDE-Q, respectively, were not significantly associated with AN subtype. This suggests that self-reported symptom intensity alone may be insufficient to capture nuanced psychological differences between ANR and ANBP. Instead, affective and interpersonal dimensions such as SC and perceived isolation may offer more discriminative value [13,25]. Additionally, our univariate analysis revealed that the ANBP group had significantly lower scores on the self-judgment subscale of the SCS than

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the ANR group. The self-judgment domain reflects harsh self-criticism and negative self-evaluation, which have previously been reported as prominent features in individuals with AN, particularly those with binge purge behaviors [5,25]. This finding aligns with those of earlier studies and suggests that elevated self-criticism may be a distinguishing psychological feature of ANBP. As self-judgment has been implicated in the maintenance of shame and affective distress and may contribute to maladaptive behaviors such as purging, it represents an important therapeutic target, especially in interventions designed to enhance SC. This supports a growing body of research advocating a dimensional, transdiagnostic approach to eating disorders, wherein emotional mechanisms are emphasized over symptom frequency alone [13].

The positive association between age at assessment and ANBP may reflect either a shift toward more severe or chronic illness trajectories over time or an age-related increase in exposure to emotionally overwhelming life events that exacerbate disordered eating behaviors. It is also possible that, as the illness progresses, the cumulative effects of isolation and affective dysregulation intensify, increasing the likelihood of developing purging behaviors. However, the cross-sectional nature of the current study prevents definitive conclusions regarding causality [7].

Clinically, these findings highlight the importance of assessing and addressing social and emotional disconnections in patients with AN, particularly those presenting with purging behaviors. Interventions that enhance SC, such as compassion-focused therapy or mindful SC training, may be particularly effective for this population, as they directly target shame, self-criticism, and emotional avoidance [6,7,9]. Furthermore, the cultural context should not be overlooked. In collectivist societies like Japan, individuals may be more prone to internalizing distress and avoiding self-disclosure, potentially amplifying feelings of isolation [5].

Future research should employ longitudinal and experimental designs to explore whether increases in SC and decreases in perceived isolation can predict improvements in clinical outcomes. Additionally, examining the mechanisms by which these emotional constructs influence symptom expression may offer valuable insights into novel therapeutic targets.

In relation to isolation, the Japanese-originated psychiatric syndrome known as hikikomori has garnered significant attention [27–29]. Hikikomori is characterized by a condition in which individuals remain confined to their homes for six months or longer. This phenomenon is not limited to Japan but has also been observed in other Asian countries and Western societies [30]. Notably, hikikomori was included in the DSM-5-TR in 2022 [31]. Issues such as shame and low self-esteem have been identified as key features of hikikomori [28]. Both hikikomori and eating disorders are syndromes that are heavily influenced by cultural and societal factors. However, no studies to date have investigated the relationship between these two conditions. Future research focusing on the role of self-compassion in the relationship between hikikomori and eating disorders is anticipated to advance our understanding of the pathophysiology of both conditions and contribute to the development of effective treatment strategies.

In summary, this study provides evidence that perceived isolation and older age are key factors associated with ANBP subtypes. These findings support the integration of emotion-focused and relational strategies into treatment models, with an emphasis on enhancing social connectedness and SC in individuals with eating disorders.

This study has some limitations. First, the sample size was modest and was derived from a single institution, which may have limited generalizability. Second, the retrospective and cross-sectional design prevented conclusions regarding the causality. Third, self-reported measures may have been subject to bias. Future longitudinal and interventional studies are warranted to confirm these findings and explore the mechanisms underlying the development of AN subtypes.

5. Conclusions

In conclusion, perceived isolation and age at assessment were significantly associated with the ANBP subtype. These findings highlight the importance of considering emotional and social factors

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when assessing and treating AN. Tailoring interventions to address isolation may improve outcomes, particularly in individuals with binge purge behavior.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of Hokkaido University Hospital (approval code: 024-0316 and approval date: 26 November 2024).

Informed Consent Statement: This retrospective study utilized anonymized clinical data without biological samples; therefore, the Institutional Review Board waived the need for informed consent in accordance with the ethical guidelines for medical and health research involving human participants [24], and authorized an opt-out approach for participant notification.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Conflicts of Interest: The authors declare no conflict of interest.

Abbreviations

The following abbreviations are used in this manuscript:

AN	Anorexia Nervosa
ANR	Anorexia Nervosa Restrictive type
ANBP	Anorexia Nervosa Binge-eating/Purging type
BMI	Body Mass Index
SC	Self-Compassion
PHQ-9	Patient Health Questionnaire-9
EDE-Q	Eating Disorder Examination Questionnaire
SCS	Self-Compassion Scale

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