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Associations of Autism Spectrum Quotient and Personality Profiles with Eating Behaviors in Patients with Anorexia Nervosa and in a Non-clinical Population

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Several lines of evidence have revealed that patients with anorexia nervosa (AN) exhibit autistic features and characteristic personality profiles. The aims of the present study were : 1) to investigate whether AN is associated with autistic features and a distinct personality profile, and 2) to examine the influence of personality profiles and autistic features on body weight and eating attitudes in a non-clinical population. Participants were 22 women with AN and 94 healthy women. All participants were administered the Temperament and Character Inventory (TCI), the Autism Spectrum Quotient (AQ), and the 26-item Eating Attitude Test (EAT-26). Consistent with previous studies, the TCI revealed that patients with AN had significantly higher 'harm avoidance' and lower 'novelty seeking', 'reward dependence', and 'self-directedness' dimension scores than healthy controls. AQ scores were significantly higher in the patient group than in the healthy controls. Further, we found that elevated AQ scores and a distinct personality profile were observed in AN patients. These were also associated with restrictive eating behaviors, as assessed by the EAT-26, in healthy individuals. Our findings suggest that high AQ scores and the characteristic TCI profile observed in patients with AN are associated with eating behaviors prior to the onset of AN. Furthermore, high AQ scores and a distinct personality profile may be a risk factor for developing AN. Further studies using a longitudinal design may confirm these findings and help to develop AN prevention methods for effectively targeting young individuals at risk. *Shinshu Med J 67 : 157—166, 2019*

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I Introduction

Anorexia nervosa (AN) is an eating disorder (ED) characterized by the following three essential features : persistent energy intake restriction ; intense fear of gaining weight or of becoming fat, or persistent behavior that interferes with weight gain ; and disturbances in body weight or shape[1]. The 12-month prevalence of AN among young women is approximately 0.3 %[2]. Risk factors for AN include a first-degree relative with AN[3] and an anxiety disorder and/or obsessional traits in childhood[4]. The semi-starvation and purging associated with AN may also result in life-threatening medical complications. Thus, a high mortality rate of 5.6 % per decade has been reported in a prior meta-analysis of AN[5].

Previous studies have suggested that certain personality traits are associated with the development of AN. Studies using the Temperament and Character Inventory (TCI) assessment have found that patients

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with AN have significantly lower 'novelty seeking' and 'reward dependence' but higher 'harm avoidance' than healthy controls[6]. Additionally, Fassino et al.[7] reported that patients with AN had elevated 'harm avoidance' and 'persistence' and low 'self-directedness' levels when compared to controls.

Although these previous studies have focused on the associations between AN and each TCI dimension, these personality dimensions do not exist in isolation but rather interact dynamically with one another. When considering the complex interactions that exist among these dimensions, a person-centered (rather than a variable-centered) statistical method may be suitable for use in classifying individuals based on their TCI dimensions. In light of this, Krug et al.[8] used a latent profile analysis to identify personality profiles associated with EDs. They utilized a six-profile solution using seven subscales and found that the "inhibited" profile was characterized by high levels of 'harm avoidance' and low levels of 'novelty seeking' and 'persistence'. The "maladaptive" profile was characterized by low levels of 'reward dependence', 'self-directedness', and 'cooperativeness', which were generally present with the greatest levels of ED symptomatology and impulsive behaviors.

Several lines of evidence have demonstrated links between AN and autism spectrum disorders (ASDs)[9)-12)]. In previous systematic reviews[13)-15)] and a meta-analysis[16)], patients with AN exhibited higher Autism Spectrum Quotient (AQ) scores than healthy controls. However, the mean AQ scores for patients with AN did not exceed the clinical cut-off for ASD[16)].

Most of the above studies were cross-sectional in design. Therefore, it is difficult to assess whether characteristic TCI profiles and high AQ scores precede the onset of AN. No previous studies have examined whether non-anorexic individuals with high AQ scores and TCI profiles characteristic of AN patients have a greater risk of developing AN. Furthermore, no studies have examined whether AQ scores and TCI profiles in a non-clinical population are associated with anorexic eating behaviors.

Given these gaps, in the present study, we investigated the personality profiles and AQ scores of Japanese women with and without AN. Further, we implemented latent profile analysis (LPA) using TCI dimensions and AQ scores as indicators to examine profiles associated with eating attitudes in non-AN participants. The aims of the present study were : 1) to investigate whether the AN group is associated with a certain personality profile and autistic features, and 2) to examine the influence of personality profiles and autistic features on body weight and eating attitudes in a non-clinical population.

Ⅱ Methods

A Participants

Participants were 116 women aged 16 years or older (22 patients with anorexia nervosa and 94 healthy controls). All participants were Japanese women recruited from Shinshu University Hospital, Matsumoto, Japan, or through poster or web-based advertisements. All diagnoses of AN were made by a psychiatrist according to the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition[1)]. The study protocol was approved by the Shinshu University ethics committee (Study no. 3375) and written informed consent was obtained from every participant.

B Clinical measures

All participants were administered the 140-item version of the TCI-Revised (TCI-R-140)[17)], the Autism Spectrum Quotient (AQ)[18)], and the 26-item Eating Attitude Test (EAT-26)[19)]. The TCI-R-140 is a 140-item true/false self-report questionnaire that measures four dimensions of temperament and three dimensions of character. The Japanese version of the TCI-R-140[20)] was used in the present study. The AQ is a self-administered questionnaire used to assess autistic spectrum characteristics in adults with normal intelligence. The evaluation of autistic characteristics in the present study was performed using the Japanese version of the AQ (AQ-J), which has good internal consistency, reliability, test-retest reliability, and discriminant validity[21)]. The EAT-26 is a 26-item self-administered questionnaire designed to measure attitudes and behaviors associated

with ED. It is comprised of three subscales : dieting, bulimia, and oral control. Levels of ED psychopathology are assessed with a 5-point Likert scale system with answers ranging from "always" to "never." A total score above 20 indicates potential disordered eating.

C Statistical analyses

Differences in demographic characteristics between patients with AN and healthy controls were examined using Mann-Whitney U test. Relationships between EAT scores and TCI, AQ, and demographic characteristics were examined separately in AN and control groups using partial correlation coefficients and controlling for age. The above analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 21.0 (IBM Corp, Armonk, New York, U.S.).

A stepwise logistic regression analysis was used to determine the optimal model for prediction of AN. This stepwise analysis was conducted as a forward stepping procedure and based on a likelihood ratio test, with $p<0.05$ indicating variable inclusion and $p>0.2$ indicating exclusion from the model. Variables used as potential predictors were scores from the seven dimensions of the TCI and AQ scores. Nagelkerke's R^2 was used to approximate the proportion of variance explained by the model[22]. The area under the receiver-operating characteristic (ROC) curve (AUC) was used to determine the predictive power of the logistic model. The predicted probability with the highest Youden index was selected as the optimal cut-off point. Statistical significance was set at a two-tailed p-value <0.05. Analyses were performed using the SPSS version 11.0 (SPSS Japan, Tokyo).

LPA was performed in healthy controls to identify latent groups based on their total AQ score and the scores on seven TCI dimensions. Simulation studies revealed that Bayesian Information Criteria (BIC), sample-size adjusted BIC (SABIC), Consistent Akaike Information Criterion (CAIC), and Bootstrap Likelihood Ratio Tests[23] were effective in selecting the best model, especially when relying on smaller samples as was the case here[24)25]. In contrast, a simulation study by Tein et al.[26] reported that Akaike Information Criterion (AIC) and entropy poorly selected the correct number of classes regardless of sample size. We determined the model containing the optimal number of profiles according to criteria outlined by previous studies[24)27]. Specifically, we first evaluated the fit of a two-profile model and the number of latent profiles was increased until it was evident that the addition of latent profiles was unjustified. Each model was evaluated using the following factors : SABIC, number of cases in each profile, and posterior probabilities associated with each profile. Other fit indices [i.e. log likelihood (LL), AIC, CAIC, BIC, and integrated classification likelihood criterion with Bayesian-type approximation (ICL)] were used to further evaluate the validity of the model. Entropy was also used to assess the overall quality of the final model. LPA was conducted by package tidyLPA using the R Project for Statistical Computing version 3.4.1[28].

After determining the best profile solution, TCI, AQ scores, BMI, and EAT scores were compared between the latent profiles using analyses of covariance (ANCOVAs), controlling for age, followed by Bonferroni post-hoc tests for pairwise comparisons.

Ⅲ Results

Table 1 shows the clinical characteristics and TCI, EAT, and AQ scores of the participants. The age distribution did not significantly differ between the AN and control groups. Patients with AN scored significantly higher on the 'harm avoidance' and significantly lower on 'novelty seeking', 'reward dependence', and 'self-directedness' than controls. EAT and AQ scores were significantly higher in patients with AN than in controls.

Table 2 and **Table 3** show the partial correlation coefficients, controlling for age, between BMI and EAT, TCI dimensions, and AQ scores in AN and control groups. BMI was significantly and negatively correlated with oral control scores in both AN and control groups. The AQ score was significantly correlated with BMI only in controls. The AQ score was significantly correlated with 'harm avoidance' and 'reward dependence' and 'cooperativeness' di-

Table 1 Clinical characteristics and TCI, EAT, and AQ scores

	Anorexia nervosa (n = 22)	Controls (n = 94)	Statistics
Clinical characteristics			
Age (years)	28.2 (10.67)	24.4 (8.0)	$U = 1150.5$, $P = 0.409$
Height (m)	1.54 (0.1)	1.58 (0.0)	$U = 745.0$, $P = 0.041$
Weight (kg)	36.6 (8.4)	50.6 (6.3)	$U = 186.5$, $P < 0.001$
BMI	15.3 (2.6)	20.3 (2.1)	$U = 137.0$, $P < 0.001$
TCI scores			
Novelty seeking	42.5 (6.7)	46.8 (6.5)	$U = 642.5$, $P = 0.006$
Harm avoidance	57.5 (7.1)	50.3 (7.7)	$U = 1600.0$, $P < 0.001$
Reward dependence	46.3 (7.8)	51.4 (6.4)	$U = 662.0$, $P = 0.009$
Persistence	48.2 (9.6)	45.5 (6.6)	$U = 1254.0$, $P = 0.121$
Self-directedness	44.1 (7.3)	51.6 (7.7)	$U = 512.5$, $P < 0.001$
Cooperativeness	51.6 (8.6)	52.7 (6.1)	$U = 951.5$, $P = 0.561$
Self-transcendence	45.5 (5.7)	44.4 (7.3)	$U = 1190.5$, $P = 0.269$
EAT scores			
Dieting	16.32 (8.1)	5.3 (5.0)	$U = 1819.0$, $P < 0.001$
Bulimia and Food Preoccupation	7.8 (4.9)	0.8 (1.8)	$U = 1839.5$, $P < 0.001$
Oral control	9.4 (5.9)	1.4 (2.3)	$U = 1938.5$, $P < 0.001$
EAT total	33.4 (14.7)	7.5 (7.3)	$U = 1957.5$, $P < 0.001$
AQ scores	28.4 (8.3)	17.5 (7.9)	$U = 1713.0$, $P < 0.001$

Data are shown as mean (standard deviation).
BMI : body mass index, TCI : Temperament and Character Inventory, EAT : Eating Attitude Test, AQ : Autism Spectrum Quotient

Table 2 Partial correlation coefficients controlling for age between BMI, and EAT, TCI dimension, and AQ scores in the patient group

	NS	HA	RD	P	SD	C	ST	EAT-1	EAT-2	EAT-3	EAT total	AQ	BMI
TCI													
Novelty seeking (NS)													
Harm avoidance (HA)	−0.18												
Reward dependence (RD)	−0.08	−0.45*											
Persistence (P)	−0.28	−0.64**	0.48*										
Self-directedness (SD)	−0.25	−0.31	−0.20	0.27									
Cooperativeness (C)	−0.43	−0.27	0.40	0.48**	0.39								
Self-transcendence (ST)	−0.39	−1.67	0.17	0.54**	−0.06	0.20							
EAT													
Dieting (EAT-1)	0.46*	−0.19	−0.28	0.15	−0.11	−0.06	0.14						
Bulimia and Food Preoccupation (EAT-2)	0.56**	0.35	−0.36	−0.30	−0.68***	−0.41	−0.16	0.58**					
Oral control (EAT-3)	−0.26	0.00	−0.10	0.12	−0.08	−0.04	0.26	0.44*	0.12				
EAT total	0.34	0.01	−0.31	0.03	−0.32	−0.18	0.13	0.91***	0.70***	0.68***			
AQ	0.03	0.59**	−0.90***	−0.51*	−0.04	−0.51*	−0.15	0.10	0.34	0.14	0.22		
BMI	0.29	−0.04	−0.11	0.03	0.02	−0.02	−0.25	−0.06	0.13	−0.66*	−0.25	−0.10	

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

TCI : Temperament and Character Inventory
NS : novelty seeking, HA : harm avoidance, RD : reward dependence, P : persistence, SD : self-directedness, C : cooperativeness, ST : self-transcendence
EAT : Eating Attitude Test
AQ : Autism Spectrum Quotient
BMI : body mass index

Table 3 Partial correlation coefficients controlling for age between BMI, and EAT, TCI dimension, and AQ scores in the control group

	NS	HA	RD	P	SD	C	ST	EAT-1	EAT-2	EAT-3	EAT total	AQ	BMI
TCI													
Novelty seeking (NS)													
Harm avoidance (HA)	−0.28**												
Reward dependence (RD)	0.33**	−0.23*											
Persistence (P)	−0.22*	−0.19	−0.12										
Self-directedness (SD)	0.02	−0.49***	0.20	0.27**									
Cooperativeness (C)	−0.18	−0.14	0.24*	0.39***	0.51***								
Self-transcendence (ST)	0.16	−0.16	0.04	0.25*	−0.03	0.08							
EAT													
Dieting (EAT-1)	−0.08	0.27**	−0.10	−0.04	−0.22*	−0.13	0.01						
Bulimia and Food Preoccupation (EAT-2)	0.01	0.25*	−0.06	−0.18	−0.12	−0.16	0.08	0.58***					
Oral control (EAT-3)	−0.26*	0.35**	−0.28**	0.05	−0.12	−0.02	−0.15	0.32**	0.24				
EAT total	−0.13	0.36***	−0.17	−0.06	−0.21*	−0.14	−0.02	0.93***	0.73***	0.59***			
AQ	−0.18	0.41***	−0.59***	−0.09	−0.38***	−0.37***	−0.03	0.22	0.30**	0.35***	0.33**		
BMI	0.10	0.11	0.22*	−0.10	−0.70	−0.04	0.04	0.09	−0.00	−0.26*	−0.02	−0.26*	

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

TCI : Temperament and Character Inventory
NS : novelty seeking, HA : harm avoidance, RD : reward dependence, P : persistence, SD : self-directedness, C : cooperativeness, ST : self-transcendence
EAT : Eating Attitude Test
AQ : Autism Spectrum Quotient
BMI : body mass index

mensions of the TCI in both AN and control groups.

Table 4 shows the results of the stepwise logistic regression analysis. The Nagelkerke R^2 values showed that 49.5 % of the variance was explained by the model. The AUC of the ROC was 0.897 (95 % confidence interval : 0.839, 0.954). The following prediction model for AN was derived :

Predicted Probability = exp (−8.084 + 0.173 × (AQ score) + 0.081 × ('persistence' score) + 0.114 × ('cooperativeness' score) − 0.150 × ('self-directedness' score))/ {1 + exp (−8.084 + 0.173 × (AQ score) + 0.081 × ('persistence' score) + 0.114 × ('cooperativeness' score) − 0.150 × ('self-directedness' score))}.

At the optimal cut-off point of 0.14, as determined by the Youden index, the sensitivity and specificity of detecting AN were 95.5 % and 73.4 %, respectively.

We next performed LPA in control participants with the seven TCI dimensions and the total AQ score as indicator variables. Fit indices of the competing latent profile models are shown in **Table 5**. The three-profile model demonstrated better fit than the two-profile model according to SABIC, LL, AIC, CAIC, BIC, and ICL. These fit indices were higher in the four-profile model than in the three-profile model. Furthermore, posterior probabilities and entropy were highest in the 3-profile model. Therefore, we rejected the four-profile model and adopted the three-profile model as best fitting.

The three profiles determined by the LPA are shown in **Fig. 1**. Profile 1, the most prevalent, had close to average scores on the AQ and all of the TCI dimensions (n = 57 ; balanced profile). Profile 2 had the highest 'novelty seeking', 'cooperativeness', and 'self-transcendence' scores and the lowest 'harm avoidance' score (n = 14 ; impulsive profile). Profile 3 had the highest AQ score and 'harm avoidance' and the lowest 'novelty seeking' dimension score (n = 23 ; high-AQ/inhibited profile). No significant difference in age was observed between profiles (F = 1.594, df = 2, p = 0.209). **Fig. 2** shows the mean BMI and EAT scores for each profile. An ANCOVA revealed significant differences in EAT scores among the three groups (F = 8.95, df = 2, p < 0.001). The total EAT score was significantly higher in the high-AQ/inhibited profile compared to the other profiles (post-hoc test with Bonferroni correction : P < 0.001

Table 4 Stepwise logistic regression analysis in patients with anorexia nervosa and controls

Step and variable	Stepwise analysis						
	Beta	SE	Wald	P value	OR	95 %CI	Nagelkerke R^2
Step 1							
AQ	0.151	0.034	19.423	＜0.001	1.164	1.088, 1.245	
Constant	−4.902	0.908	29.133	＜0.001	0.007		0.332
Step 2							
AQ	0.17	0.038	19.962	＜0.001	1.186	1.1, 1.278	
P	0.088	0.04	4.798	0.028	1.092	1.009, 1.182	0.389
Constant	−9.481	2.425	15.284	＜0.001	＜0.001		
Step 3							
AQ	0.144	0.041	12.383	＜0.001	1.154	1.066, 1.251	
P	0.113	0.043	7.003	0.008	1.12	1.03, 1.218	
SD	−0.114	0.047	5.873	0.015	0.892	0.814, 0.978	0.456
Constant	−4.727	3.082	2.352	0.125	0.009		
Step 4							
AQ	0.173	0.046	13.863	＜0.001	1.189	1.085, 1.302	
P	0.081	0.045	3.164	0.075	1.084	0.992, 1.185	
SD	−0.15	0.054	7.805	0.005	0.861	0.775, 0.956	0.495
Cooperativeness	0.114	0.06	3.59	0.058	1.12	0.996, 1.26	
Constant	−8.084	2.331	4.729	0.03	＜0.001		

SE : standard error ; OR : odds ratio : 95 %CI : 95 % confidence interval ; AQ : autism spectrum quotient, P : persistence, SD : self-directedness

Table 5 Fit indices for the latent profile analysis

Profiles	Number of cases	PP (range)	SABIC	LL	AIC	CAIC	BIC	ICL	Entropy
2	21, 73	(0.919, 0.966)	4898.047	2412.287	4930.573	5118.368	5065.368	5075.050	0.955
3	14, 23, 57	(0.959, 0.993)	4851.251	2382.650	4889.300	5108.985	5046.985	5053.630	0.969
4	11, 16, 21, 46	(0.940, 0.991)	4871.077	2386.325	4914.650	5166.224	5095.224	5104.215	0.958
5	9, 14, 15, 20, 36	(0.911, 0.998)	4840.095	2364.596	4889.191	5172.655	5092.655	5104.227	0.949

PP : posterior probability, SABIC : sample-size adjusted Bayesian Information Criteria, LL : log likelihood
AIC : Akaike Information Criterion, CAIC : Consistent Akaike Information Criterion, BIC : Bayesian Information Criteria, ICL : integrated classification likelihood criterion with Bayesian-type approximation

versus balanced profile and P＜0.01 versus impulsive profile).

Ⅳ Discussion

The present study revealed that TCI-R profiles significantly differ between women with and without AN. High 'harm avoidance' and low 'novelty seeking', 'reward dependence', and 'self-directedness' scores were observed in patients with AN, results that are consistent with the existing literature[6]. Our results also agreed with a previous study comparing TCI in Japanese women with and without ED, which found that ED patients scored significantly higher on 'harm avoidance' and lower on 'self-directedness'[29].

We also found that the AQ scores of patients with AN were significantly higher than those of controls. These findings also agree with previous studies that found that autistic characteristics were higher in patients with AN[13)30)31)]. However, the cross-sectional design of the present study, as well as those of previous studies[10)32)], does not allow us to infer whether autistic characteristics were premorbidly present in patients with AN. The observed autistic characteristics in patients with AN may partly be due to the inefficiencies in set-shifting and central coherence caused by acquiring AN[33)34)].

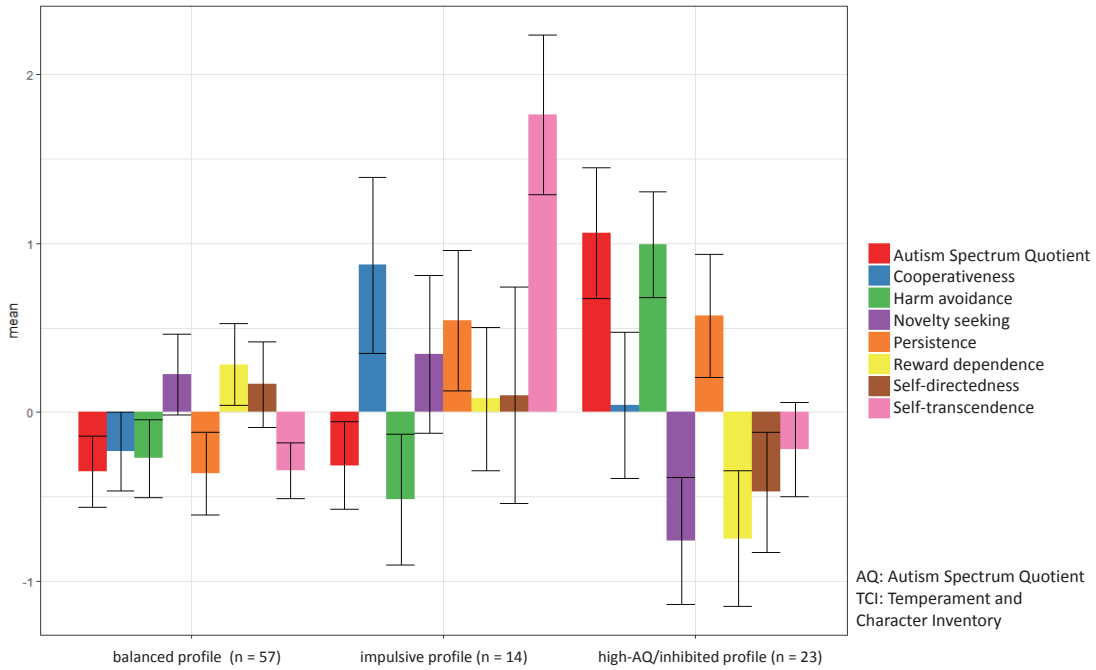

Fig. 1　AQ and TCI dimension scores for each profile in non-clinical participants

The three profiles determined by latent profile analysis in the control group using the seven TCI dimensions and total AQ scores as indicator variables are shown.

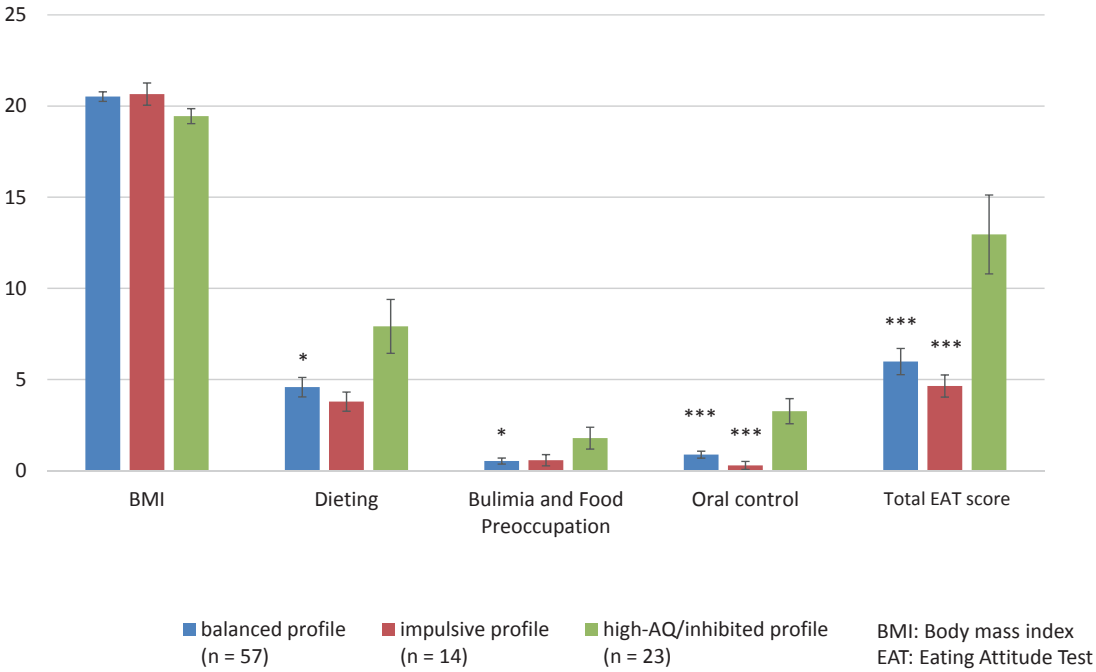

Fig. 2　BMI and EAT scores for each profile in non-clinical participants

Mean BMI and EAT scores for each profile, determined via latent profile analysis in the control group, are shown. An ANCOVA, controlling for age, revealed significant EAT score difference among profiles. Error bars show the standard errors of the means. Pairwise Bonferroni-corrected post hoc tests revealed significantly higher EAT scores in the high-AQ/inhibited profile than in other profiles.

*$p < 0.05$ when compared with profile 3

**$P < 0.01$ when compared with profile 3

***$P < 0.001$ when compared with profile 3

It might also be speculated, based on our findings in the control group, that autistic characteristics are present before the onset of AN. AQ scores in the control group here were significantly and negatively correlated with BMI and significantly and positively correlated with EAT scores. These findings suggest that autistic characteristics are related to restrictive eating behaviors, even in those who have not yet been diagnosed with AN. The correlation between AQ scores and BMI or EAT scores in patients with AN was smaller and nonsignificant, suggesting that the strong presence of autistic characteristics is a risk factor for developing AN but may not necessarily be associated with the severity of AN.

The oral control subscale score was significantly and negatively correlated with BMI in both the AN and control groups. These findings in the patient group are consistent with a previous study by Garner et al.[19]. These correlations were also observed in the control group, which indicates that the oral control subscale score may be particularly useful in screening women for risk of emaciation and AN. We found that high 'harm avoidance' and low 'self-directedness' scores were associated not only with AN but also with problematic eating behaviors in a non-clinical population. A recent study found that obese individuals had higher 'self-directedness' scores than non-obese individuals, and that high 'harm avoidance' and low 'self-directedness' scores were associated with binge eating and night eating in obese individuals[35]. Taken together, high 'harm avoidance' and low 'self-directedness' may lead to various eating problems in non-AN individuals and may be another risk factor for developing AN.

Low 'novelty seeking' was also associated with high oral control subscale in the control group. In contrast, Dalle Grave et al.[9] reported that high 'novelty seeking' was associated with binge eating in obese individuals. Therefore, high 'novelty seeking' may be a protective factor against restrictive eating but may increase the risk of uncontrolled eating.

The LPA in control individuals revealed that problematic eating behaviors were most likely to be observed in the high-AQ/inhibited group. This result supports our finding that high AQ and 'harm avoidance' and low 'novelty seeking', 'reward dependence', and 'self-directedness' are associated with elevated risk for AN. Although no significant differences in the persistence dimension was observed between patients with AN and controls, our LPA results show that high 'persistence' dimension scores were associated with the individual's personality profile and thus related to problematic eating behaviors. A logistic regression analysis also revealed that high levels of 'persistence' allowed for improved discrimination between ANs and controls. The AQ scores and personality profiles in the high-AQ/inhibited group resembled those of AN patients, suggesting that non-AN individuals with autistic features and the personality profiles characteristic of AN are likely to exhibit anorexic eating behaviors and are at an elevated risk for developing AN.

While it offers significant benefits, the present study also has several limitations that warrant some discussion. First, a self-report questionnaire was used to collect participant data. Therefore, data on individuals' height and weight may not be accurate. Secondly, we did not collect medical history information from participants in the control group. Therefore, we are unable to correct for diseases that might have confounded our data. Thirdly, the present study had a limited sample size. A limited number of AN participants did not allow us to perform LPA in the patient group. Future studies with larger sample sizes are necessary to confirm the present findings and to further elucidate the role of personality profiles in AN pathology. Finally, only Japanese women were included in the present study, limiting the potential for generalization of our findings to other populations.

In conclusion, the present study replicated previous studies by finding that patients with AN had higher 'harm avoidance' and AQ scores and lower 'novelty seeking', 'reward dependence', and 'self-directedness' dimension scores than did healthy controls. Further, we report, for the first time to our knowledge, that a distinct personality profile and high AQ scores were associated with restrictive eating behaviors in a non-clinical population. Our

findings reveal that patients with AN have high AQ and characteristic TCI profiles (i.e. high 'harm avoidance' and 'persistence' and low 'novelty seeking' and 'reward dependence') and further suggest the possibility that such personality profile and autistic features may be a risk factor for developing AN. Further studies using a longitudinal study design may confirm these findings and may help to develop AN prevention methods that effectively target young individuals at greatest risk.

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