

Internal consistency and factor structure of the Eating Disorder Inventory among clinical and non-clinical subjects in Taiwan

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Introduction

The Eating Disorder Inventory (EDI-1) is a widely used self-reported measure of symptoms associated with anorexia nervosa (AN) and bulimia nervosa (BN). Previous factor analytic work on the EDI supported the first-order 8-factor measurement structure among clinical patients, but it appeared less consistent in nonclinical samples. In this study, we aimed to examine the psychometric properties of the Mandarin Chinese version of the EDI (C-EDI) among both patient and non-patient groups.

Methods

The EDI-1 consists of three subscales, Drive for Thinness (DT), Bulimia (B), and Body Dissatisfaction (BD), assessing attitudes and behaviors about eating, weight, and shape and five subscales, Perfectionism (P), Ineffectiveness (IE), Interpersonal Distrust (ID), Interoceptive Awareness (IA), and Maturity fear (MF), for measuring psychological functioning. A total of 551 female patients with eating disorders and a group of 751 nursing college students completed the C-EDI. Patients were diagnosed as having AN ($n = 111$), BN ($n = 349$), or ED not otherwise specified (EDNOS) ($n = 91$). Both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to examine the construct validity of the C-EDI in both groups. EFA was performed by a forced eight-factor solution using principal axis factoring with promax rotation. CFA was examined by structural equation modeling with maximum likelihood method using LISREL 8.71 (SSI Inc., Chicago, IL, USA).

Results

The values of the alpha coefficients were larger than 0.80 for B, BD, IE, and IA subscales and near or above 0.70 for the remaining subscales in the patient group, indicating acceptable level of internal consistency in patient group. Using 0.3 as the cutoff, the item-subscale correlations were acceptable for the eight subscales with the exception of a few items (1, 6, 11, and 57). The values of the alpha coefficient in the non-patient group were comparable to the patient group except ID (Cronbach's $\alpha = 0.56$), and more items with item-subscale correlations lower than 0.3 (1, 6, 26, 30, 34, 53, 54, and 57) were found. One-way ANOVA showed significant differences of 8 subscale scores between 3 patient groups and female students. Post-hoc comparison revealed that subscale scores of patient group were significantly higher than those of non-patient group except IA of AN-restricting patients, BD of AN patients, and MF of EDNOS patients (Table 1). With a few exceptions, the original clinically-derived eight EDI subscales were clearly identified in EFA in both groups and explained 50.8% and 47.3% of the variance in the patient and non-patient group, respectively. The model-fit indices of CFA indicated that the original 1st-order 8-factor structure was barely acceptable for Taiwanese patients with ED. Moreover, we grouped the 3 eating and weight-related subscales and the 5 general psychological functioning subscales to derive two 2nd-order factors, the model-fit indices for this 2nd-order factor structure were comparable to those of 1st-order structure in both the patient and non-patient groups (Table 2).

Conclusions

The C-EDI is a psychometrically sound questionnaire for both clinical and non-clinical subjects.

Table 1 Mean scores of the EDI subscales for anorexia nervosa, bulimia nervosa, EDNOS and female students

EDI subscales	Anorexia Nervosa, restricting ($n = 35$)	Anorexia Nervosa, Bulimia Nervosa, binge/purging ($n = 76$)	ED, not otherwise specified ($n = 349$)	Female students ($n = 91$)	Female students ($n = 751$)
Drive for Thinness***	7.4 ± 5.9 _a	11.8 ± 6.0 _b	13.6 ± 4.4 _b	11.9 ± 4.6 _b	6.3 ± 5.0 _c
Bulimia***	2.2 ± 3.6 _a	12.2 ± 7.5 _b	14.7 ± 4.8 _c	10.7 ± 6.1 _b	2.2 ± 3.5 _a
Body Dissatisfaction***	10.5 ± 6.6 _a	12.5 ± 5.8 _a	19.0 ± 6.7 _b	18.5 ± 6.8 _b	13.1 ± 7.1 _a
Ineffectiveness***	10.7 ± 7.3 _a	14.9 ± 6.9 _b	14.3 ± 7.3 _b	12.7 ± 8.0 _b	5.2 ± 4.9 _c
Perfectionism***	6.3 ± 4.3 _{a,b}	8.7 ± 5.1 _a	8.3 ± 4.6 _a	7.4 ± 5.3 _a	4.0 ± 3.6 _b
Interpersonal Distrust***	4.2 ± 4.2 _{a,b}	6.1 ± 4.0 _a	4.9 ± 3.4 _a	5.4 ± 4.3 _a	3.7 ± 3.3 _b
Interoceptive Awareness***	7.0 ± 6.7 _a	13.0 ± 6.6 _b	13.5 ± 7.0 _b	11.1 ± 6.6 _{b,c}	7.4 ± 7.2 _a
Maturity Fear***	9.0 ± 5.3 _{a,b}	12.2 ± 5.7 _a	9.5 ± 5.3 _{b,c}	8.8 ± 5.6 _{c,d}	8.5 ± 5.2 _d
EDI Total***	57.3 ± 31.5 _a	91.3 ± 29.0 _b	97.8 ± 28.1 _b	86.4 ± 30.7 _b	64.9 ± 5.8 _c

Different lower case letter indicates differences among groups ($P < 0.01$ for each comparison)

Table 2 Goodness-of-Fit indicators for 1st-order and 2nd-order confirmatory factor analyses for patients and female students

Mode	χ^2	χ^2/dfs	CFI	SRMSR	RMSEA (90% CI)
Eating disorder patients					
1st order					
Original eight factor model	5970.662	3.10 ^a	0.916	0.0914	0.0713 (0.0695, 0.0730)
2nd order					
Two 2 nd factor model	7537.614	3.88 ^b	0.914	0.0971	0.0724 (0.0706, 0.0741)
Female college students					
1st order					
Original eight factor model	4479.893	2.33 ^c	0.929	0.0591	0.0421 (0.0405, 0.0437)
2nd order					
Two 2 nd factor model	4898.725	2.52 ^d	0.923	0.0611	0.0450 (0.0435, 0.0466)

CFI = comparative fit index; SRMSR = standardized root-mean-square residual; RMSEA = root-mean-square error of approximation

^a $df = 1924$, ^b $df = 1943$, ^c $df = 1924$, ^d $df = 1943$