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Validation of the Italian translation of the perceived stigma scale and resilience assessment in inflammatory bowel disease patients

Sara Cococcia
Università degli Studi di Pavia

Marco Vincenzo Lenti

Caterina Mengoli
Università degli Studi di Pavia

Catherine Klersy
Fondazione IRCCS Policlinico San Matteo

Federica Borrelli de Andreis

See next page for additional authors

Author First name, Last name, Institution

Sara Cococcia, Marco Vincenzo Lenti, Caterina Mengoli, Catherine Klersy, Federica Borrelli de Andreis, Matteo Secco, Jihane Ghorayeb, Mariangela Delliponti, Gino Roberto Corazza, and Antonio Di Sabatino

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ORCID number: Sara Cococcia 0000-0002-1507-6513; Marco Vincenzo Lenti 0000-0002-6654-4911; Caterina Mengoli 0000-0002-2253-7795; Catherine Klersy 0000-0003-0314-8548; Federica Borrelli de Andreis 0000-0003-2933-8825; Matteo Secco 0000-0002-8285-3706; Jihane Ghorayeb 0000-0002-8382-4106; Mariangela Delliponti 0000-0002-3184-0673; Gino Roberto Corazza 0000-0001-9532-0573; Antonio Di Sabatino 0000-0002-0302-8645.

Sara Cococcia, Marco Vincenzo Lenti, Caterina Mengoli, Federica Borrelli de Andreis, Matteo Secco, Mariangela Delliponti, Gino Roberto Corazza, Antonio Di Sabatino, First Department of Internal Medicine, San Matteo Hospital Foundation, University of Pavia, Pavia 27100, Lombardia, Italy

Catherine Klersy, Service of Biometry & Statistics, Foundation IRCCS Policlinico San Matteo, Pavia 27100, Lombardia, Italy

Jihane Ghorayeb, Psychology, Zayed University, Dubai 00000, United Arab Emirates

Corresponding author: Marco Vincenzo Lenti, MD, Academic Research, Doctor, Research Assistant Professor, Research Scientist, First Department of Internal Medicine, San Matteo Hospital Foundation, University of Pavia, Viale Camillo Golgi, 19, Pavia 27100, Lombardia, Italy. marco.lenti@unipv.it

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Institutional review board

Abstract

BACKGROUND

Stigmatization is the separation of an individual from a group due to aspects that make them different. Resilience may in turn influence the perception of stigma. Patients with inflammatory bowel disease (IBD) are susceptible to stigma, although data are very limited.

AIM

To validate an Italian translation of the IBD perceived stigma scale (PSS) in relation to patients' resilience.

METHODS

Consecutive IBD outpatients were prospectively enrolled (December 2018-September 2019) in an Italian, tertiary referral, IBD center. Clinical and demographic data were collected. Stigma and resilience were evaluated through the IBD-PSS and the 25-item Connor-Davidson Resilience Scale, respectively. The International Quality of Life Assessment Project approach was followed to translate the IBD-PSS into Italian and to establish data quality. Higher scores represent greater perceived stigma and resilience. Multivariable analysis for factors associated with greater stigma was computed.

RESULTS

Overall, 126 IBD patients (mean age 46.1 ± 16.9) were enrolled. The International Quality of Life Assessment criteria for acceptable psychometric properties of the scale were satisfied, with optimal data completeness. There was no ceiling effect, whilst floor effect was present (7.1%). The discriminant validity and the internal consistency reliability were good (Cronbach alpha = 0.87). The overall internal consistency was 95%, and the test-retest reliability was excellent 0.996. The median PSS score was 0.45 (0.20-0.85). Resilience negatively correlated with perceived stigma (Spearman's correlation = -0.18, 95% confidence intervals: -0.42-0.08, $P = 0.03$).

CONCLUSION
We herein validated the Italian translation of the PSS scale, also demonstrating that resilience negatively impacts perceived stigma.

Key Words: Crohn's disease; Quality of life; Stress; Ulcerative colitis

Core Tip: We have here validated an Italian version of the Perceived Stigma Scale for patients with inflammatory bowel disease. We have also found that resilience levels negatively correlated with perceived stigma. This is the first study assessing this issue in patients with inflammatory bowel disease.

INTRODUCTION

Stigmatization is defined as the societal identification of an individual as abnormal and worthy of separation from the group, leading to discrimination and loss of their social status[1]. It has been reported that inflammatory bowel disease (IBD) is susceptible to stigmatization, not only because of the *taboo* around its symptoms, but also due to the assumption of being a psychosomatic condition affecting people because of their "obsessive behavior"[2] and because it affects sexual life[3]. Stigmatization in IBD patients was reported to be as high as 84%, regardless of disease activity[4].

An important aim of taking care of chronic patients should be the improvement of their quality of life (QoL), taking into account the social context and their needs[5]. Nonetheless, it emerged from a recent review that the burden of stigmatization in IBD, and the ability to positively cope with the disease (*i.e.* resilience), are not adequately addressed by clinicians[6]. In IBD patients, resilience has been found to be influenced by individual characteristics, including age, sex, and employment status and to influence positively the disease prognosis[7-9]. Stigma can be evaluated through the use of different scales, including the IBD perceived stigma scale (PSS)[10], which has been adapted and used in IBD patients[11]. Similarly, resilience can be measured through the Connor-Davidson resilience scale (CD-RISC), a 25-item self-administrated scale exploring different aspects related to the individual ability to cope with adversity and stress[12]. The CD-RISC was initially designed for psychiatric American patients, and it has now been translated into more than 70 languages, being the most widely used resilience scale in a variety of conditions[13].

The first study looking into perceived stigma in IBD showed that functional impairment was mainly due to IBD patients' psychological dimension rather than to their physical one. They also reported that patients with Crohn's disease (CD) had a higher degree of perceived stigma than patients with ulcerative colitis (UC)[14]. While perceived stigma is difficult to address and modify, resilience is responsive to

behavioral intervention and is independently associated with better QoL and lower disease activity in IBD[9].

There are very limited data regarding perceived stigma in IBD, and no validated translation of the PSS into Italian is available. As a consequence, perceived stigma in Italian IBD patients has never been assessed. Therefore, we aimed to validate the Italian version of the PSS in IBD patients in order to obtain a meaningful instrument for assessing stigmatization and compare with international studies. We also assessed resilience and its relation with stigmatization.

MATERIALS AND METHODS

Study population

All IBD patients followed-up at the IBD Clinical & Research Centre of the San Matteo Hospital Foundation were consecutively enrolled between December 2018 and September 2019. IBD diagnosis was established according to internationally agreed criteria[15]. Patients were eligible for inclusion if they had at least a 3-mo history of IBD, were aged ≥ 18, were able to complete a questionnaire, and were willing to give written informed consent. Patients with an inconclusive or uncertain diagnosis of IBD or those diagnosed less than 3 mo before or unwilling to provide informed consent were excluded. Demographic and clinical characteristics were gathered, including IBD type, disease activity and duration, comorbidities, and previous IBD-related surgery. Clinical activity was assessed using the Harvey-Bradshaw index (HBI)[16,17] for CD and the partial Mayo score (pMayo)[18] for UC. For CD patients, HBI < 5 was defined as clinical remission, HBI 5-7 as mild disease, HBI 8-16 as moderate disease, and HBI > 16 as severe disease[16,17]. For UC patients, pMayo < 2 was defined as remission, pMayo 2-4 was defined as mild activity, pMayo 5-7 was defined as moderate activity, and pMayo > 7 was defined as severe activity[18]. The study was approved by the local Ethics Committee (Protocol Number 20190003611), and all participants gave their informed written consent to take part to the study and for the anonymized publication of data. The study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a priori approval by the institution's human research committee.

Assessment of the PSS

The PSS was initially designed to assess stigma in irritable bowel syndrome (IBS) patients and was validated in IBD in 2009 in a cohort of patients from the United States [4]. The PSS is a self-administered questionnaire designed to measure perceived stigma through 10 items on a five-point Likert scale (ranging from 0 = never to 4 = always), with a higher score reflecting a greater level of perceived stigma. Each item is assessed on two different domains: Significant others (SO) and healthcare professionals (HP), leading to a total of 20 items. The two-domain PSS version has already been used for different gastrointestinal disease and was found to have an excellent internal consistency and split-half reliability (≥ 0.89)[19].

The score indicating the perceived stigma ranges from 0 to 4 and is obtained by calculating the mean of all the values and the values within each domain.

Translation and cultural validation

We aimed to create a version that was easy to understand and complete by Italian IBD patients, without losing the original English version's equivalence and psychometric validity. The translation and adaptation were made in accordance with the International QoL Assessment (IQOLA) Project approach, which consists of three steps: A forward translation, a backward translation, and a cognitive testing[20,21].

Step 1—Forward translation: Two bilingual physicians (Lenti MV and Cococcia S) blindly translated the questionnaire from English into Italian. The two versions were compared, and discrepancies reconciled. Difficulty and degree of agreement of the translation were rated on a 1 to 100 scale (lowest–highest). For each item, the agreed forward translation was accepted if the scores were ≥ 75, otherwise retranslation was independently performed and scoring repeated.

Step 2—Backward translation: The Italian translation was blindly translated back into British English by two mother-tongue English people with a high educational level (graduated). The same reconciliation process reported for the forward translation was applied. The equivalence of the agreed backward translation to the original version

was rated and expected to be ≥ 75. If that threshold was not reached, the four translators had to agree on a new forward translation.

Step 3—Cognitive testing: Cognitive testing of the agreed Italian version was performed on 10 individuals with different age, sex, and educational background to verify that the translation was clear and understandable by a range of different people. Finally, a panel discussion was held to approve the final version (see Supplementary data).

Resilience assessment

Resilience was assessed through the Italian validated translation of the CD-RISC scale, a self-administered questionnaire assessing resilience through 25 items on a five-point Likert scale (ranging from 0 = totally disagree to 4 = totally agree)[12]. The score is calculated by summing the score of each item (ranging from 0 to 100) with higher scores meaning higher resilience.

Statistical analysis and psychometric evaluation

The sample size was computed based on the primary endpoint. A sample of 100 subjects responding to 20 items would achieve 80% power to detect the difference between the coefficient alpha under the null hypothesis of 0.70 and the coefficient alpha under the alternative hypothesis of 0.81, using a two-sided F-test with a significance level of 0.05. Twenty-six extra patients were enrolled to account for possible dropouts.

The PSS scoring was performed according to the scoring manuals, meaning that higher scores represent a higher level of perceived stigma. The psychometric evaluation of the Italian version of the PSS questionnaire included evaluation of data quality, including completeness (Table 1). Results were described as mean and standard deviation, and ceiling and floor effect were evaluated. Reliability was assessed and expressed by means of Cronbach's alpha for internal consistency, alpha = $k \times r / [1+(k-1) \times r]$; with k = number of items and r = mean correlation. Item internal consistency (correlation of item and corresponding scale, corrected for overlap), equality of item-scale correlations, and item discriminant validity (correlation of item with the corresponding scale *vs* correlation of item with other scales) were evaluated through the multi-trait/multi-item correlation matrix. Means of Pearson's correlation coefficient and intraclass correlation coefficient were used to evaluate the test-retest correlation for temporal stability (within 1 mo), with 95% confidence intervals (95%CI). External validity was assessed through the comparison of PSS scores in patients with different characteristics by means of the Kruskall Wallis test, the test for trend; the correlation with continuous variables was assessed with the Spearman R. Stata 16 (StataCorp, College Station, TX, United States) was used for all computations. All tests were two-sided, and a *P* value < 0.05 was considered statistically significant. In the presence of missing data, missing items were replaced by the median of the corresponding scale, unless more than 50% of the items were missing, in which instance the questionnaire was dropped.

RESULTS

Demographic and clinical characteristics

Overall, 146 IBD patients were screened for inclusion in the study. Of these, 20 patients did not participate because denied consent (15 patients) or because were due to be followed up in another hospital. Hence, 126 IBD patients (mean age 46.1 ± 16.9, male 56.4%), 57 with CD and 69 with UC, were consecutively enrolled in the study. The demographic and clinical characteristics of the enrolled patients are reported in Table 2. CD patients were significantly younger than UC patients (42.3 ± 15.7 *vs* 49.3 ± 17.4; *P* = 0.03). Psychiatric disorders, including anxiety and depression, were the most common concomitant diseases (25.4%), followed by hypertension (22.2%) and cardiomyopathy (11.9%), which was significantly more common among UC patients (17.4% *vs* 5.26%; *P* = 0.05). Overall, the median disease duration was 8 years [interquartile range (IQR) 3-16]. The majority of the CD patients had a disease with an inflammatory behavior (56.1%), 43.9% had a structuring behavior, and 28.1% had a penetrating disease. Almost half of the CD patients (49.1%) had ileo-colonic involvement, and 33.3% had perianal disease. Among UC patients, half (52.2%) had an extensive disease, 37.7% had a left UC, 10.1% had an ulcerative proctitis, and 4.4% had

Table 1 Thresholds defining acceptable psychometric properties according to the International Quality of Life Assessment project

	Definition	Threshold
Data quality		
Missing items	Unanswered items	< 5%-10%
	Incomplete scales (< 50% of items answered)	< 5%-10%
Floor and ceiling effect	Extreme scores (either on the lower- or higher-end)	< 10%
Scaling assumption		
Internal consistency		
Item	Correlation among items of the same scale (Pearson correlation ≥ 0.4)	> 90%
Reliability	Overall consistency of the scale (Cronbach's alpha coefficient)	> 0.7
Discriminant validity	Items whose Pearson correlation with other scales is higher than with their scale	0%
Test-retest evaluation	Correlation between the results scales filled in twice by the same patients at defined time points (Pearson correlation)	> 0.7

a pouch. The proportion of patients with severe disease activity was higher among UC patients (10.1% *vs* 0%), while two-thirds were in remission in both groups. A quarter of the enrolled patients had an extraintestinal manifestation (28.6%), including anemia, arthritis, uveitis, and dermatological manifestations. When available, calprotectin and C-reactive protein (CRP) were used as inflammatory markers. Overall, 34.1% of the patients had a calprotectin < 50 mg/kg, 16.2% between 51-250 mg/kg, and 12.7% > 250 mg/kg with no difference according to the disease ($P = 0.54$). Similarly, 61.1% of the patients had a normal CRP, whilst roughly a third had raised levels of CRP (31.0%), with no difference between UC and CD patients ($P = 1.00$).

Translation and cultural validation

The PSS was translated according to the IQOLA project guidelines[20,21]. For the forward translation, the median difficulty was rated as 10 (range: 10-60) and the agreement was found to be 95 (range: 70-100). Items 1, 5, and 10 were adjusted after discussion. The backward translation equivalence was rated at 95 (range: 80-100). Minor changes were made to item 2 and 4 of the Italian translation to improve the original version's equivalence. A cognitive testing of the agreed Italian version was performed on 10 individuals with different ages (median 48-years-old, range: 29-88), sex (5 female), and educational background (5 graduated), which did not lead to any adjustment of the scale. Supplementary data show the validated Italian version of the PSS-IBD, while the questions of the original English version have already been published elsewhere[4].

Psychometric evaluation

The majority of the IQOLA criteria for acceptable psychometric properties of the scale were satisfied in our cohort as reported in Table 3. We reached an optimal data completeness, and we did not have any ceiling effect, whilst a floor effect was present in 7.1% of the cases (overall domain). The floor effect was greater for the HP domain when compared to the SO domain (42.1% *vs* 8.7%). When looking at scaling assumption, the internal consistency reliability of the Italian version of the PSS was good, with an overall Cronbach alpha coefficient of 0.87 (0.83 for SO and 0.81 for HP). Although an excellent item, internal consistency was found in each domain, with a Pearson correlation ranging from 0.4 to 0.6, and one item (item 8, SO domain) did not reach the predetermined threshold of 0.4, determining an overall item internal consistency of 95% (still indicative of an excellent item internal consistency). The discriminant validity of the scale was good for items 1 to 7 in both domains, whereas items 8 to 10 had exactly the same Pearson correlation with their domain and the other one for both SO and HP.

The test-retest reliability was excellent, being 0.999 (0.997-1.000) overall, 0.99 (0.997-1.000) in the SO domain and 0.994 (0.979-0.998) in the HP domain. The median PSS score was 0.45 (0.20-0.85) with a significantly higher score for the SO domain (0.70 IQR 0.40-1.40 *vs* 0.10 IQR 0.00-0.40, $P < 0.001$), whilst the median resilience score was 64 (IQR 53-78). The level of perceived stigma did not differ according to sex ($P = 0.51$), IBD type ($P = 0.33$), disease activity, age ($P = 0.11$), or disease duration ($P = 0.49$) (See

Table 2 Demographic and clinical characteristics of the validating cohort			
	Overall (*n* = 126)	CD (*n* = 57)	UC (*n* = 69)	*P* value
Age (mean ± SD)	46.13 (± 16.95)	42.29 (± 15.7)	49.29 (± 17.38)	0.03
Male	71 (56.4%)	33 (57.9%)	38 (55.1%)	0.86
BMI	23.9 (± 4.1)	23.9 (± 4.3)	23.9 (± 3.9)	0.67
Disease duration (median, IQR)	8 (3-16)	10 (3-17)	8 (3.5-13)	0.44
Disease characteristics (CD)			
Location (CD)	-		-
Terminal ileum (L1)		13 (22.8%)	
Colon (L2)		8 (14.0%)	
Ileo-colon (L3)		28 (49.1%)	
Upper GI (L4)		2 (3.5%)	
Perianal disease (p)		19 (33.3%)	
Behavior (CD)	-	-	
Inflammatory (B1)		32 (56.1%)	
Stricturing (B2)		25 (43.9%)	
Penetrating (B3)		16 (28.1%)	
Disease activity (HBI)	-	-	
< 5		38 (66.7%)	
5-7		14 (24.6%)	
8-16		5 (8.8%)	
> 16	-	0 (0%)	
Disease characteristics (UC)			-
Location	-	-	7 (10.1%)
Proctitis (E1)			26 (37.7%)
Left sided (E2)			36 (52.2%)
Extensive (E3)			
Disease activity (pMayo)	-		
< 2			45 (65.2%)
2-4			13 (18.8%)
5-7			4 (5.8%)
> 7			7 (10.1%)
Pouch			3 (4.4%)
Extraintestinal manifestations	36 (28.6%)	17 (29.8%)	19 (27.5%)	0.84
Previous abdominal surgery	38 (30.2%)	22 (38.6%)	16 (42.1%)	0.07
Calprotectin				0.54
< 50	43(34.1%)	15 (26.3%)	28 (40.6%)	
51-250	33 (16.2%)	17 (29.8%)	16 (23.2.%)	
> 250	16 (12.7%)	7 (12.3%)	9 (13.4%)	
Missing	34 (27.0%)	18 (31.6%)	16 (23.2%)	
CRP				1.00
Normal	77 (61.1)	35 (62.4%)	42 (60.9%)	
Raised	39 (31.0%)	18 (31.6%)	21 (30.4%)	

Missing	10 (7.9%)	4 (7.0%)	6 (8.7%)	
Comorbidities	40 (31.8%)	16 (28.1%)	24 (34.8%)	0.45
Cardiomyopathy	15 (11.9%)	3 (5.26%)	12 (17.4%)	0.05
Hypertension	28 (22.2%)	12 (42.9%)	16 (23.2%)	0.83
Diabetes	11 (8.73%)	4 (7.0%)	7 (10.1%)	0.75
Hepatic failure	1 (0.8%)	1 (1.8%)	0 (0.0%)	0.45
Kidney failure	4 (3.17%)	3 (5.26%)	1 (1.45%)	0.32
Respiratory failure	2 (1.6%)	1 (1.8%)	1 (1.5%)	1.00
Neurologic diseases	5 (4.0%)	1 (1.8%)	4 (5.8%)	0.37
Psychiatric disorder	15 (11.9%)	7 (12.3%)	8 (11.6%)	1.00
Onco-hematological diseases	12 (9.5%)	2 (3.5%)	10 (14.5%)	0.06

BMI: Body mass index; CD: Crohn's disease; CRP: C-reactive protein; GI: Gastrointestinal; HBI: Harvey-Bradshaw Index; IQR: Interquartile range; PMS: Partial Mayo Score; SD: Standard deviation; UC: Ulcerative colitis.

Table 3 Psychometric characteristics of perceived stigma scale and its sub-scales

	Overall	Significant others	Healthcare professionals
Median score	0.45 (0.20-0.85)	0.70 (0.30-1.40)	0.10 (0-0.40)
Data quality			
Missing items	0 (0%)	0 (0%)	0 (0%)
Floor effect	9 (7.1%)	11 (8.7%)	53 (42.1%)
Ceiling effect	0 (0%)	0 (0%)	0 (0%)
Scaling assumption			
Internal consistency			
Item	19/20 (95.0%)	10/10 (100%)	10/10 (100%)
Reliability (Cronbach alpha)	0.87	0.83	0.81
Discriminant validity	-	30.0%	30.0%
Test-retest	0.99 (0.99-1.00)	0.999 (0.99-1.00)	0.99 (0.97-0.99)
Evaluation[a]			

[a]Intraclass correlation coefficient (95% confidence interval).

Table 4). On the contrary, disease activity was found to significantly reduce resilience (Spearman's correlation -0.18, 95%CI: -0.42-0.08, *P* = 0.03) in CD patients, whilst no significant difference was found in UC patients according to the disease activity (*P* = 0.23). When exploring the relations between perceived stigma and resilience, a significant negative Spearman's correlation was found (-0.20, 95%CI: -0.36 to -0.02; *P* = 0.03).

DISCUSSION

Stigmatization is an important, though often unattended, issue in clinical medicine. Whilst for other conditions (*e.g.*, human immunodeficiency virus, mental illness, and lung cancer) stigmatization has been widely studied[22-25], IBD data are scant and fragmentary. This might be partly due to the lack of a validated tool to be used for this purpose. We herein validated an Italian version of the PSS questionnaire that performs well, has good psychometric properties, and is easily understandable. The psychometric evaluation of the Italian PSS version showed an excellent Cronbach alpha coefficient, item internal consistency, and test-retest reliability. Our results are in line

Table 4 Correlation between inflammatory bowel disease perceived stigma scale scores and demographic or clinical characteristics

	PSS	*P*	Spearman's correlation (95%CI)	PSS SO	*P*	Spearman's correlation (95%CI)	PSS HP	*P*	Spearman's correlation (95%CI)
Median score (IQR)	0.45 (0.20 to 0.85)			0.70 (0.30 to 1.40)			0.10 (0.00 to 0.40)		
Age		0.11	-0.14 (-0.31 to 0.03)		0.08	-0.157 (-0.33 to 0.02)		0.20	-0.116 (-0.29 to 0.06)
Sex		0.51			0.26			0.29	
Female	0.45 (0.30 to 0.85)			0.70 (0.50 to 1.40)			0.10 (0.00 to 0.40)		
Male	0.45 (0.15 to 0.90)			0.70 (0.20 to 1.40)			0.10 (0.00 to 0.50)		
Diagnosis		0.33			0.35			0.34	
CD	0.55 (0.25 to 0.95)			0.80 (0.40 to 1.40)			0.10 (0.00 to 0.50)		
UC	0.45 (0.20 to 0.85)			0.70 (0.30 to 1.30)			0.10 (0.00 to 0.40)		
HBI		0.91	0.05 (-0.22 to 0.30)		0.91	0.05 (-0.21 to 0.31)		0.70	0.11 (-0.16 to 0.36)
< 5	0.53 (0.25 to 0.80)			0.75 (0.50 to 1.30)			0.10 (0.00 to 0.50)		
5-7	0.60 (0.10 to 1.15)			0.90 (0.20 to 1.60)			0.30 (0.00 to 0.50)		
8-16	0.40 (0.10 to 1.40)			0.70 (0.20 to 1.80)			0.10 (0.00 to 0.80)		
pMS		0.52	0.06 (-0.18 to 0.29)		0.44	0.03 (-0.21 to 0.26)		0.81	0.11 (-0.13 to 0.34)
< 2	0.40 (0.20 to 0.85)			0.60 (0.40 to 1.30)			0.10 (0.00 to 0.30)		
2-4	0.45 (0.05 to 0.75)			0.60 (0.10 to 1.20)			0.20 (0.00 to 0.40)		
5-7	0.75 (0.48 to 1.22)			1.40 (0.90 to 1.75)			0.15 (0.05 to 0.70)		
> 7	0.35 (0.15 to 1.50)			0.70 (0.00 to 2.70)			0.10 (0.00 to 0.70		
CD-RISC25	-	0.03	-0.20 (-0.36 to -0.02)	-	0.02	-0.20 (-0.36 to -0.03)	-	0.12	-0.14 (-0.31 to 0.04)

CD: Crohn's disease; CD-RISC25: 25-item Connor-Davidson Resilience Scale; CI: Confidence interval; HBI: Harvey-Bradshaw Index; HP: Healthcare professionals; IQR: Interquartile range; pMS: Partial Mayo Score; SO: Significant others; UC: Ulcerative colitis.

with previous literature validating stigma scales in different settings[4,10,26,27], showing that our translation is reliable and offers a tool to assess stigma in Italian IBD patients. In our cohort, the main concern is the high floor effect recorded, especially in the HP domain. However, this result was partially expected since all the included patients were followed-up at a tertiary IBD center. These patients likely experience lower levels of perceived stigma since they are looked after by IBD dedicated HP, whereas a different result might be obtained if the questionnaire would be administered in different settings, such as community centers or private practices. Even considering the setting bias, the level of perceived stigma was found to be lower than expected (median 0.45, IQR 0.20-0.85), when compared to previous literature showing a low-to-moderate level of perceived stigma among IBD patients, using the PSS[4]. This might be explained by the fact that the PSS has been originally designed to address perceived stigma in patients affected by a functional disorder rather than by an organic disease, such as IBD. In the PSS questionnaire, there are no questions addressing some of IBD patients' main concerns, including the fear of relapsing or of incontinence. Therefore, even if this scale offers a useful tool to assess stigma in IBD, it is our opinion that some adjustments are needed.

Additionally, levels of perceived stigma in IBD patients tend to decrease in long-standing disease, in contrast with what happens for IBS[11]. Since IBD is an organic disease not associated with unhealthy or socially unacceptable vices, it is therefore

more likely to be recognized and accepted as a "real" organic disease over time, especially when compared to IBS[11]. Most of the included patients have a longstanding history, which could have led to lower levels of perceived stigma in our sample.

Stigmatization is multifactorial and is influenced by both patient-dependent and environment-dependent factors[28-30]. Among these factors, we have previously speculated that a relation between stigma and resilience may exist[6]. In line with previous literature, we found a moderate level of resilience in our cohort[9]. We have here shown for the first time that, in IBD patients, higher levels of resilience correlate with lower levels of perceived stigma (overall and for SO) and, conceivably, to better QoL. Such correlation was not found for the HP domain, which might be due to the high floor effect reported in this domain. In case of adversity, resilience can modulate catecholamine and cortisol production reducing long-term effects on the body[31] and leading to better outcome also in IBD, which requires continuous adaptation to the unpredictable course of the disease. This hypothesis is supported by a recent study in which higher levels of resilience are associated with lower disease activity, although it is unclear if this result was due to reverse causation[9]. Our findings suggest that downstream public health intervention that focus on patients' resilience may reduce the level of perceived stigma and consequently may improve the patients' QoL. Follow-up data are being gathered to support this hypothesis, since resilience is easily influenced by other events and a single assessment might be misleading. In addition to intervention focused on building individual resilience, upstream public health interventions are needed to reduce stigma around IBD improving the awareness on the disease.

This study has some limitations. Firstly, the sample size was calculated to validate the Italian translation of the PSS and was not adequate to draw firm conclusions about the level of perceived stigma among IBD patients. Larger prospective studies are needed to explore this aspect. Secondly, the majority of the included patients had a low disease activity and that could represent a bias in interpreting the results. Stigma is internalized over time and, since IBD is a chronic disease, the level of perceived stigma is influenced mostly by the social environment rather than by acute events. On the contrary, resilience is strongly influenced by contextual events and can be improved through behavioral intervention, and this is why the ongoing follow-up of these patients will be useful to better assess the relation between stigma and resilience in IBD. Additionally, the level of resilience of the sampled patients ranged from average to good, and this might have played a role in lowering the stigma scores.

CONCLUSION

To conclude, we have herein developed a validated Italian version of the PSS. Also, we have assessed for the first-time stigmatization and its relation with resilience in a cohort of IBD patients. Interventions aimed at building a stronger resilience may reduce perceived stigma. The follow-up data on the variation of stigma and resilience levels over time are being collected.

ARTICLE HIGHLIGHTS

Research background
Patients living with inflammatory bowel disease (IBD) often experience a poor quality of life due to stigmatization that can be assessed through the IBD perceived stigma scale (PSS). Resilience is the ability to cope positively with a specific disease or situation.

Research motivation
Stigmatization in IBD patients, especially in relation to one's own resilience, has been poorly characterized. A validated Italian version of the IBD-PSS is not available.

Research objectives
To validate an Italian version of the PSS in IBD patients and to assess patients' resilience and its relation with stigmatization.

Research methods

We enrolled 126 consecutive IBD patients (mean age 46.1 ± 16.9, male 56.4%), 57 with CD and 69 with UC, in an Italian, tertiary referral, IBD center. Clinical and demographic data were collected, and stigma and resilience were evaluated through the IBD-PSS and the 25-item Connor-Davidson Resilience Scale, respectively. Psychometric validity of the IBD-PSS was assessed, and a multivariable analysis for factors associated with greater stigma was computed.

Research results

We found that the Italian version of the IBD-PSS had an acceptable reliability, having a Cronbach alpha of 0.87, with an excellent test-retest score. The median PSS score was 0.45 (0.20-0.85), and resilience negatively correlated with perceived stigma (Spearman's correlation -0.18, 95%CI: -0.42-0.08, P = 0.03).

Research conclusions

We have developed a reliable tool to be used in clinical practice for assessing stigmatization in Italian IBD patients. Also, we found that resilience may have an influence on stigmatization, possibly improving patients' illness perception.

Research perspectives

The Italian IBD-PSS should be used extensively in order to assess this important endpoint in the care of IBD patients. More prospective, long-term studies looking at more detailed factors influencing stigmatization and resilience are urgently needed.

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REFERENCES

1   **Link BG**, Phelan JC. Conceptualizing stigma. *Annu Rev Sociol* 2001; **27**: 363-385 [DOI: 10.1146/annurev.soc.27.1.363]

2   **Sheffield BF**, Carney MW. Crohn's disease: a psychosomatic illness? *Br J Psychiatry* 1976; **128**: 446-450 [PMID: 1276548 DOI: 10.1192/bjp.128.5.446]

3   **Taft TH**, Keefer L. A systematic review of disease-related stigmatization in patients living with inflammatory bowel disease. *Clin Exp Gastroenterol* 2016; **9**: 49-58 [PMID: 27022294 DOI: 10.2147/CEG.S83533]

4   **Taft TH**, Keefer L, Leonhard C, Nealon-Woods M. Impact of perceived stigma on inflammatory bowel disease patient outcomes. *Inflamm Bowel Dis* 2009; **15**: 1224-1232 [PMID: 19180581 DOI: 10.1002/ibd.20864]

5   **Levenstein S**, Li Z, Almer S, Barbosa A, Marquis P, Moser G, Sperber A, Toner B, Drossman DA. Cross-cultural variation in disease-related concerns among patients with inflammatory bowel disease. *Am J Gastroenterol* 2001; **96**: 1822-1830 [PMID: 11419836 DOI: 10.1111/j.1572-0241.2001.03878.x]

6   **Lenti MV**, Cococcia S, Ghorayeb J, Di Sabatino A, Selinger CP. Stigmatisation and resilience in inflammatory bowel disease. *Intern Emerg Med* 2020; **15**: 211-223 [PMID: 31893346 DOI: 10.1007/s11739-019-02268-0]

7   **Luo D**, Lin Z, Shang XC, Li S. "I can fight it! *Int J Nurs Sci* 2019; **6**: 127-133 [PMID: 31406881 DOI: 10.1016/j.ijnss.2018.12.008]

8   **Acciari AS**, Leal RF, Coy CSR, Dias CC, Ayrizono MLS. Relationship among psychological well-being, resilience and coping with social and clinical features in crohn's disease patients. *Arq Gastroenterol* 2019; **56**: 131-140 [PMID: 31460575 DOI: 10.1590/S0004-2803.201900000-27]

9   **Sehgal P**, Ungaro RC, Foltz C, Iacoviello B, Dubinsky MC, Keefer L. High Levels of Psychological Resilience Associated With Less Disease Activity, Better Quality of Life, and Fewer Surgeries in Inflammatory Bowel Disease. *Inflamm Bowel Dis* 2021; **27**: 791-796 [PMID: 32696966 DOI: 10.1093/ibd/izaa196]

10   **Jones MP**, Keefer L, Bratten J, Taft TH, Crowell MD, Levy R, Palsson O. Development and initial validation of a measure of perceived stigma in irritable bowel syndrome. *Psychol Health Med* 2009;

14: 367-374 [PMID: 19444714 DOI: 10.1080/13548500902865956]

11   **Taft TH**, Keefer L, Artz C, Bratten J, Jones MP. Perceptions of illness stigma in patients with inflammatory bowel disease and irritable bowel syndrome. *Qual Life Res* 2011; **20**: 1391-1399 [PMID: 21424542 DOI: 10.1007/s11136-011-9883-x]

12   **Connor KM**, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). *Depress Anxiety* 2003; **18**: 76-82 [PMID: 12964174 DOI: 10.1002/da.10113]

13   **Connor KM**, Davidson JR.   Translations of the CD-RISC [cited February 14, 2021]. In: Connor-Davidson Resilience Scale. Available from: http://www.connordavidson-resiliencescale.com/translations.php

14   **Drossman DA**, Patrick DL, Mitchell CM, Zagami EA, Appelbaum MI. Health-related quality of life in inflammatory bowel disease. Functional status and patient worries and concerns. *Dig Dis Sci* 1989; **34**: 1379-1386 [PMID: 2766905 DOI: 10.1007/BF01538073]

15   **Maaser C**, Sturm A, Vavricka SR, Kucharzik T, Fiorino G, Annese V, Calabrese E, Baumgart DC, Bettenworth D, Borralho Nunes P, Burisch J, Castiglione F, Eliakim R, Ellul P, González-Lama Y, Gordon H, Halligan S, Katsanos K, Kopylov U, Kotze PG, Krustinš E, Laghi A, Limdi JK, Rieder F, Rimola J, Taylor SA, Tolan D, van Rheenen P, Verstockt B, Stoker J; European Crohn's and Colitis Organisation [ECCO] and the European Society of Gastrointestinal and Abdominal Radiology [ESGAR]. ECCO-ESGAR Guideline for Diagnostic Assessment in IBD Part 1: Initial diagnosis, monitoring of known IBD, detection of complications. *J Crohns Colitis* 2019; **13**: 144-164 [PMID: 30137275 DOI: 10.1093/ecco-jcc/jjy113]

16   **Harvey RF**, Bradshaw JM. A simple index of Crohn's-disease activity. *Lancet* 1980; **1**: 514 [PMID: 6102236 DOI: 10.1016/s0140-6736(80)92767-1]

17   **Sandborn WJ**, Feagan BG, Hanauer SB, Lochs H, Löfberg R, Modigliani R, Present DH, Rutgeerts P, Schölmerich J, Stange EF, Sutherland LR. A review of activity indices and efficacy endpoints for clinical trials of medical therapy in adults with Crohn's disease. *Gastroenterology* 2002; **122**: 512-530 [PMID: 11832465 DOI: 10.1053/gast.2002.31072]

18   **Rutgeerts P**, Sandborn WJ, Feagan BG, Reinisch W, Olson A, Johanns J, Travers S, Rachmilewitz D, Hanauer SB, Lichtenstein GR, de Villiers WJ, Present D, Sands BE, Colombel JF. Infliximab for induction and maintenance therapy for ulcerative colitis. *N Engl J Med* 2005; **353**: 2462-2476 [PMID: 16339095 DOI: 10.1056/NEJMoa050516]

19   **Guadagnoli L**, Taft TH, Keefer L. Stigma perceptions in patients with eosinophilic gastrointestinal disorders. *Dis Esophagus* 2017; **30**: 1-8 [PMID: 28475723 DOI: 10.1093/dote/dox014]

20   **Bullinger M**, Alonso J, Apolone G, Leplège A, Sullivan M, Wood-Dauphinee S, Gandek B, Wagner A, Aaronson N, Bech P, Fukuhara S, Kaasa S, Ware JE Jr. Translating health status questionnaires and evaluating their quality: the IQOLA Project approach. International Quality of Life Assessment. *J Clin Epidemiol* 1998; **51**: 913-923 [PMID: 9817108 DOI: 10.1016/s0895-4356(98)00082-1]

21   **Ware JE Jr**, Gandek B. Methods for testing data quality, scaling assumptions, and reliability: the IQOLA Project approach. International Quality of Life Assessment. *J Clin Epidemiol* 1998; **51**: 945-952 [PMID: 9817111 DOI: 10.1016/s0895-4356(98)00085-7]

22   **Rössler W**. The stigma of mental disorders: A millennia-long history of social exclusion and prejudices. *EMBO Rep* 2016; **17**: 1250-1253 [PMID: 27470237 DOI: 10.15252/embr.201643041]

23   **Henderson C**, Noblett J, Parke H, Clement S, Caffrey A, Gale-Grant O, Schulze B, Druss B, Thornicroft G. Mental health-related stigma in health care and mental health-care settings. *Lancet Psychiatry* 2014; **1**: 467-482 [PMID: 26361202 DOI: 10.1016/S2215-0366(14)00023-6]

24   **Rueda S**, Mitra S, Chen S, Gogolishvili D, Globerman J, Chambers L, Wilson M, Logie CH, Shi Q, Morassaei S, Rourke SB. Examining the associations between HIV-related stigma and health outcomes in people living with HIV/AIDS: a series of meta-analyses. *BMJ Open* 2016; **6**: e011453 [PMID: 27412106 DOI: 10.1136/bmjopen-2016-011453]

25   **Chapple A**, Ziebland S, McPherson A. Stigma, shame, and blame experienced by patients with lung cancer: qualitative study. *BMJ* 2004; **328**: 1470 [PMID: 15194599 DOI: 10.1136/bmj.38111.639734.7C]

26   **Zhu M**, Zhou H, Zhang W, Deng Y, Wang X, Bai X, Li M, Hu R, Hou J, Liu Y. The Stroke Stigma Scale: a reliable and valid stigma measure in patients with stroke. *Clin Rehabil* 2019; **33**: 1800-1809 [PMID: 31307214 DOI: 10.1177/0269215519862329]

27   **Pourmarzi D**, Khoramirad A, Ahmari Tehran H, Abedini Z. Validity and Reliability of Persian Version of HIV/AIDS Related Stigma Scale for People Living With HIV/AIDS in Iran. *J Family Reprod Health* 2015; **9**: 164-171 [PMID: 27047562]

28   **Bifftu BB**, Dachew BA. Perceived Stigma and Associated Factors among People with Schizophrenia at Amanuel Mental Specialized Hospital, Addis Ababa, Ethiopia: A Cross-Sectional Institution Based Study. *Psychiatry J* 2014; **2014**: 694565 [PMID: 24967300 DOI: 10.1155/2014/694565]

29   **Chandra**, A Minkovitz CS. Factors that Influence Mental Health Stigma Among 8th Grade Adolescents. *J Youth Adolescence* 2007; **36**: 763-774 [DOI: 10.1007/s10964-006-9091-0]

30   **Brown RL**. Perceived stigma among people with chronic health conditions: the influence of age, stressor exposure, and psychosocial resources. *Res Aging* 2015; **37**: 335-360 [PMID: 25651574 DOI: 10.1177/0164027514533133]

31   **Bowirrat A**, Chen TJ, Blum K, Madigan M, Bailey JA, Chuan Chen AL, Downs BW, Braverman ER, Radi S, Waite RL, Kerner M, Giordano J, Morse S, Oscar-Berman M, Gold M. Neuro-psychopharmacogenetics and Neurological Antecedents of Posttraumatic Stress Disorder: Unlocking the Mysteries of Resilience and Vulnerability. *Curr Neuropharmacol* 2010; **8**: 335-358 [PMID:

21629442 DOI: 10.2174/157015910793358123]