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Psychometric Validation of the Self-Care Self-Efficacy Scale in Individuals With Inflammatory Bowel Disease

A Multicenter Cross-Sectional Study

OPEN

ABSTRACT

This study was conducted to assess the psychometric properties of the Self-Care Self-Efficacy Scale and determine its validity and reliability in measuring self-efficacy related to self-care among individuals with inflammatory bowel disease (IBD). A multicenter, cross-sectional study was conducted across nine specialized IBD centers in Italy. Participants completed the Self-Care Self-Efficacy Scale and provided sociodemographic and clinical information. Confirmatory factor analysis was conducted to evaluate factorial validity. Reliability was assessed through McDonald's Omega, composite reliability, and factor score determinacy. A total of 456 patients were included (mean age 43.49 ± 16.39 years; 49% women). Confirmatory factor analysis supported a unidimensional structure. The Self-Care Self-Efficacy Scale showed excellent internal consistency ($\omega = 0.90$), strong composite reliability (0.88), and high factor score determinacy (0.92). All corrected item-total correlations exceeded 0.30, supporting adequate item discrimination. The Self-Care Self-Efficacy Scale was found to be a valid and reliable instrument for assessing self-efficacy in IBD self-care. Its brevity (10 items) makes it feasible for both clinical and research use, allowing identification of patients with low self-efficacy and supporting tailored interventions to enhance self-care, symptom control, and quality of life.

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The study was approved by the Territorial Ethics Committee Lazio 3 (Approval No. 0023486/23) and registered on ClinicalTrials.gov (Identifier: NCT06015789). All procedures followed the principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants.

Informed consent was obtained from all individual participants included in the study.

The authors declare no conflicts of interest.

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Inflammatory bowel diseases (IBD), which include ulcerative colitis and Crohn disease, consist of chronic conditions marked by recurring gastrointestinal symptoms such as abdominal pain, diarrhea, and rectal bleeding. With 0.5% of Western populations currently affected by IBD (Kaplan & Windsor, 2021), symptoms significantly affect daily functioning and overall quality of life (QoL) (Khan et al., 2024). Additionally, IBD is associated with increased psychological distress, including heightened anxiety and depression, further diminishing QoL (Dragasevic et al., 2025).

Managing IBD effectively involves proactive patient engagement in self-care practices, which play a crucial role in enhancing clinical outcomes for individuals living with chronic conditions (Napolitano et al., 2024). These conditions require ongoing management, including medication adherence, dietary modifications, symptom monitoring, and stress management (Riegel et al., 2021).

The concept of self-efficacy, defined as an individual's belief in their ability to perform specific tasks or behaviors, plays a crucial role in determining the success of self-care practices. In this context, the Self-Care Self-Efficacy Scale (SC-SES) has been developed as a tool to assess an individual's confidence in their ability to engage in self-care activities (Yu et al., 2021). However, before its widespread adoption in clinical and research settings, it is essential to establish the psychometric properties of the SC-SES to ensure its accuracy, consistency, and applicability in measuring self-care and self-efficacy among individuals with IBD.

Background

The SC-SES is designed to evaluate individuals' confidence in their ability to perform self-care activities (Yu et al., 2021). The assessment of self-efficacy in self-care is particularly relevant in IBD patients, as the disease requires continuous symptom management, adherence to complex treatment regimens, and lifestyle modifications (Napolitano et al., 2025a, 2025b). Effective self-care can help reduce disease flares, improve QoL, and minimize complications. Self-efficacy theory, introduced by Bandura (1977), suggests that higher self-efficacy levels are associated with better adherence to health behaviors, improved health outcomes, and greater resilience in managing chronic illnesses (Achury-Saldaña et al., 2025; Bonsaksen et al., 2012).

Self-efficacy refers to individuals' beliefs about their ability to achieve desired outcomes through specific actions, even in the face of obstacles or discomfort (Bandura, 1977). It regulates behavior by enhancing cognitive control, reducing emotional distress, and strengthening persistence. Crucially, Bandura emphasized that self-efficacy is task-specific, meaning that

individuals' confidence must be measured in terms of concrete actions rather than general capabilities.

In recent years, several disease-specific self-efficacy instruments have been developed for the IBD population, such as the IBD-SES (Keefer et al., 2011) and its shortened version (Tanaka et al., 2024). While these instruments have demonstrated solid psychometric performance in their respective populations, their application to IBD remains limited. Notably, a few disease-specific self-efficacy measures have been developed and validated for IBD. Keefer et al. (2011) introduced the IBD-SES, offering one of the first tools to specifically address self-efficacy in IBD patients for managing their condition (Keefer et al., 2011). More recently, Tanaka et al. (2024) developed and validated a 13-item short version of this scale, enhancing its feasibility for clinical and research use. Furthermore, Sheehan et al. (2023) explored the relationship between self-efficacy and the day-to-day impact in IBD, reinforcing the central role of self-efficacy in disease management. These efforts underscore the importance of assessing self-efficacy in IBD but also highlight the need for ongoing validation of instruments tailored to this unique population.

The instruments described above assess general self-efficacy in managing IBD but do not capture self-efficacy in practicing self-care behaviors, such as monitoring symptoms, managing treatment, or responding to symptom exacerbations. In other words, they do not assess the patient's confidence in doing self-care—only in managing the disease more broadly.

The SC-SES was developed specifically to fill this gap by measuring self-efficacy in performing self-care tasks. It is grounded in the Middle-Range Theory of Self-Care of Chronic Illness (Riegel et al., 2012), which defines self-care as a process involving maintenance (routine behaviors to preserve stability), monitoring (tracking and interpreting symptoms), and management (responding to symptom changes). The SC-SES thus allows researchers and clinicians to assess patient confidence in engaging in each of these specific self-care components.

The internal consistency of the SC-SES has been demonstrated to be high, with Cronbach's alpha coefficients supporting its reliability across these cultural contexts (Yu et al., 2021). In the Italian adaptation of the SC-SES, reliability remained robust, with a Cronbach's alpha coefficient of 0.92 (Yu et al., 2021). Although the SC-SES has been translated and validated across different cultural groups, it has not been psychometrically validated in patients with IBD. Given the complex and often unpredictable course of IBD, having a reliable tool to assess task-specific self-efficacy in managing self-care behaviors is essential. Validating the SC-SES in the IBD population will ensure that the

scale accurately captures self-efficacy in this unique clinical context, providing health care professionals with a valuable resource to tailor interventions, guide education, and support long-term disease management.

Aim

The aim of this study was to assess the psychometric properties of the SC-SES to determine its suitability as a measurement tool for evaluating self-care self-efficacy in individuals with IBD.

Methods

Design

A cross-sectional, multicenter design was employed in this study. The study protocol was reviewed and approved by the Local Ethics Committee (Territorial Ethics Committee Lazio 3) (Approval No. 0023486/23) and was registered on ClinicalTrials.gov (Identifier: NCT06015789).

Sample and Setting

A total of 456 individuals diagnosed with IBD were recruited from nine specialized IBD centers throughout Italy: four located in the Northern region, two in the Central region, and three in the Southern region of the country (Napolitano et al., 2024). Eligibility criteria included: (1) adults aged 18 years or older; (2) confirmed diagnosis of IBD; (3) ability to understand and respond to questions; and (4) adequate comprehension of the Italian language. Exclusion criteria comprised a diagnosis of IBD within the previous 12 months and any IBD-related surgical intervention within the last six months.

Data Collection

Participants were approached during their scheduled outpatient visits and invited to participate after receiving comprehensive information about the study's aims and procedures. Data were collected during these clinical visits. Enrollment was finalized only after each participant provided signed informed consent. The questionnaire was self-administered by participants at the conclusion of their initial outpatient appointment, requiring only a few minutes to complete. A trained research assistant was present during questionnaire completion to provide support and address any uncertainties regarding the items.

Instruments

The SC-SES comprises 10 items rated on a 5-point Likert scale, ranging from 1 ("not confident") to 5 ("extremely confident"), where higher scores reflect greater perceived self-efficacy. The SC-SES has been validated across diverse cultural populations (Andersson et al., 2022; Chen et al., 2022; Chica-Perez et al., 2023;

Herrero-Hahn et al., 2017; Lv et al., 2024; Tanaka et al., 2023). Its psychometric properties, including construct validity and factorial structure, have been confirmed through confirmatory factor analysis (CFA) in four distinct cohorts (Yu et al., 2021).

In addition, a structured questionnaire was administered to collect sociodemographic and clinical data. This instrument captured information including age, sex, level of education, type of pathology, disease severity, marital status, and employment condition.

Ethical Considerations

The study adhered to the principles outlined in the Good Clinical Practice guidelines and the most recent revision of the Declaration of Helsinki. Written informed consent was obtained from all participants before study inclusion. Comprehensive verbal and written information regarding the study's objectives and procedures was provided to each participant.

Data Analysis

To characterize the study participants' sociodemographic and clinical profiles, descriptive statistics were employed. The distribution of the items was assessed using skewness and kurtosis calculations. Before conducting CFA, the Mardia test was utilized to evaluate multivariate skewness and kurtosis (Kres, 1983). Given the significance of multivariate skewness and kurtosis, a robust estimator was applied within the CFA framework.

To assess model fit (Tanaka, 1993), we considered the following goodness-of-fit indices: Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) (acceptable fit: 0.90–0.95; good fit: >0.95), root mean square error of approximation (RMSEA) (poor fit: ≥ 0.10 ; moderate fit: 0.05–0.08; good fit: <0.05), RMSEA with 90% confidence intervals (good fit: 0.05–0.08) (MacCallum et al., 1996), and the standardized root mean square residual (SRMR) (good fit: <0.08) (Hu & Bentler, 1999). Additionally, traditional chi-square (χ^2) statistics were reported, but due to the large sample size and the sensitivity of the chi-square likelihood ratio test to sample size, the chi-square results were not used to interpret the model fit (Cheung & Rensvold, 2002). A sample size of at least 200 patients was deemed sufficient for conducting an effective CFA (Kline, 2023).

To ensure a thorough psychometric evaluation, the reliability of the SC-SES was assessed using several complementary methods. Composite reliability coefficients were computed for identified factors following Fornell and Larcker's recommendations (Fornell & Larcker, 1981). Furthermore, omega (ω) was calculated because it is a more suitable measure of reliability (Kelley & Pornprasertmanit, 2016; Zinbarg et al., 2005). The internal consistency of the factor solution

was evaluated using the factor score determinacy coefficient, which represents the correlation between the true and estimated factor scores. This coefficient ranges from 0 to 1, indicating how well the factor is measured (Muthén & Muthén, 2017).

Adhering to current psychometric benchmarks, reliability was judged to be satisfactory when McDonald's omega and composite reliability coefficients reached or exceeded 0.70 (Cesario & McDonald, 2013; Tabachnick & Fidell, 2013), with values of 0.80 or higher indicating strong internal consistency (Revelle & Zinbarg, 2009). Item discrimination was evaluated using corrected item-total correlation coefficients (Crocker & Algina, 2008), with values of 0.30 or above considered acceptable based on established psychometric criteria (Nunnally & Bernstein, 1994).

Descriptive statistics, generated via Jamovi (Şahin & Aybek, 2020), summarized the sociodemographic and clinical characteristics of the study participants. Subsequently, SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, New York). All statistical analyses were performed using Mplus version 7.1 (Los Angeles, California; Muthén & Muthén, 2017).

Results
Sample Characteristics

The sociodemographic and clinical characteristics of the study participants are presented in Table 1. A total of 456 patients were recruited for this study. The mean age of the participants was 43.49 (standard deviation = 16.39) years. More males (50.4%) than females were recruited for the overall sample. Participants were typically experienced with their conditions, having been diagnosed, on average, 11.68 years prior (Table 1).

Descriptive statistics for the SC-SES items are presented in Table 2. The item distributions were moderately skewed and slightly leptokurtic. Mardia multivariate test revealed significant departures from normality (skewness = 191.42, $p < .001$; kurtosis = 348.05, $p < .001$). Given the non-normality of the data, confirmatory factor analyses were conducted using robust estimation methods (MLR).

Dimensionality

A one-factor CFA model was specified to test the unidimensional structure of SC-SES. Starting from an initial factorial model, specific residual covariances were added for these item pairs: 8 and 9, 2 and 3, 4 and 5, 7 and 8, 3 and 5, 9 and 10, 8 and 10, 6 and 7, and 7 and 9, 7 and 10, building upon the Italian model proposed by Yu et al. (2021). These modifications addressed methodological artifacts consistent with the proximity effect described by Weijters et al. (2009, 2010), whereby adjacent positively worded items demonstrate correlated error terms. Nonadjacent pairs (e.g., items 7–10)

TABLE 1. Sociodemographic Characteristics of the Participant Sample (N = 456)

Characteristic	Overall
Years of treatment at the center, M (SD)	6.04 (5.74)
Previous surgery, n (%)	
Never	314 (69.3)
Yes, more than once	74 (16.3)
Yes, once	65 (14.3)
Previous medical hospitalization, n (%)	
Never	162 (35.8)
Yes, more than once	170 (37.5)
Years since diagnosis, M (SD)	11.67 (9.42)
Sleep management, n (%)	
Sometimes	232 (51.2)
Feeling fatigue, n (%)	
Sometimes	212 (46.8)
Never	136 (30.0)
Often	83 (18.3)
Most of the time	14 (3.1)
Always	8 (1.8)
Habit of using supplements, n (%)	183 (40.4)
Eating habits, n (%)	
Adjusts their diet	178 (39.3)
Avoids bad foods	126 (27.8)
Cares carefully	102 (22.5)
Does not pay attention	47 (10.4)
Exercise habits, n (%)	
None	156 (34.4)
Limited	160 (35.3)
Good	92 (20.3)
Excellent	45 (9.9)
Smoking habits, n (%)	
Nonsmoker	230 (50.8)
Ex-smoker	125 (27.6)
Smoker	98 (21.6)
Daily activities, n (%)	
Moderate	269 (59.4)
Sedentary	101 (22.3)
Intense	83 (18.3)
Occupation, n (%)	
Worker	287 (63.4)
Student	56 (12.4)
Retired	52 (11.5)
Unemployed	30 (6.6)
Housewife	28 (6.2)

(Continued)

TABLE 1. Continued

Characteristic	Overall
Education, n (%)	
High school	202 (44.6)
University degree or above	147 (32.5)
Secondary school	89 (19.6)
Up to secondary school	15 (3.3)
Type of pathology, n (%)	
Ulcerative colitis	230 (50.8)
Crohn disease	223 (49.2)
Age, M (SD)	43.49 (16.39)
Gender, n (%)	
Female	222 (49.0)

Note. Percentages may not sum to 100 due to rounding.
M = mean; SD = standard deviation.

exhibited covariances attributable to shared wording characteristics rather than positional effects.

The goodness-of-fit indices indicated an adequate fit for the model, after investigating the modification indices: $\chi^2(34) = 92.23, p < .001$; RMSEA = 0.06 (90% CI = 0.05–0.08), which is below the commonly accepted threshold of 0.08, indicating a good fit; CFI = 0.96; TLI = 0.94, both of which are above the recommended value of 0.90, further supporting the model fit; SRMR = 0.06, which is well below the threshold of 0.08, suggesting an excellent fit. The factor loadings for the latent variables in their respective observed indicators

are presented in Table 3. All loadings were statistically significant.

Reliability

The internal consistency of SC-SES was excellent, with a McDonald’s omega (ω) of 0.90. The composite reliability was also strong (CR = 0.88) and factor score determinacy was high ($\lambda = 0.92$), indicating a reliable estimation of latent scores. Corrected item-total correlations ranged from 0.49 (item 1) to 0.72 (item 5), all above the recommended threshold of 0.30, supporting adequate item discrimination.

Discussion

This study evaluated the psychometric properties of SC-SES among IBD patients, addressing a critical gap in disease-specific self-efficacy measurement tools for self-care management. Grounded in the Middle-Range Theory of Chronic Illness, the SC-SES conceptualizes self-efficacy as a fundamental determinant of effective self-care behaviors. Our findings provide substantial evidence supporting the instrument’s validity and reliability in this population, confirming theoretical consistency with Riegel’s self-care framework (Riegel et al., 2012), which positions self-efficacy as an essential precursor to successful self-care behaviors.

The sample of 456 patients demonstrated balanced gender representation (49% women, 50.4% male), ensuring clinical diversity and representativeness of the IBD population. CFA supported the unidimensional structure through a theoretically grounded modeling approach. Following the Italian validation framework established by Yu et al. (2021), we incorporated

TABLE 2. Descriptive Statistics for the Self-Care Self-Efficacy Scale (SC-SES) Items (N = 456)

	M (SD)	Skewness	Kurtosis
In general, how confident are you that you can:			
1. Keep yourself stable and free of symptoms?	3.39 (1.12)	-0.33	-0.65
2. Follow the treatment plan you have been given?	4.09 (0.86)	-0.76	0.07
3. Persist in following the treatment plan even when difficult?	4.09 (0.89)	-0.94	0.86
4. Monitor your condition routinely?	4.13 (0.87)	-0.86	0.33
5. Persist in routinely monitoring your condition even when difficult?	4.03 (0.91)	-0.82	0.33
6. Recognize changes in your health if they occur?	4.06 (0.83)	-0.83	0.65
7. Evaluate the importance of your symptoms?	4.14 (0.82)	-0.88	0.69
8. Do something to relieve your symptoms?	3.98 (0.95)	-0.89	0.41
9. Persist in finding a remedy for your symptoms even when difficult?	3.96 (0.96)	-0.82	0.35
10. Evaluate how well a remedy works?	4.05 (0.84)	-0.74	0.31

Note. Higher scores indicate greater self-care self-efficacy. M = Mean; SD = Standard Deviation.

TABLE 3. Standardized Factor Loadings From the Final Confirmatory Factor Analysis Model of the SC-SES

In general, how confident are you that you can:	
1. Keep yourself stable and free of symptoms?	0.49
2. Follow the treatment plan you have been given?	0.65
3. Persist in following the treatment plan even when difficult?	0.62
4. Monitor your condition routinely?	0.71
5. Persist in routinely monitoring your condition even when difficult?	0.73
6. Recognize changes in your health if they occur?	0.67
7. Evaluate the importance of your symptoms?	0.67
8. Do something to relieve your symptoms?	0.66
9. Persist in finding a remedy for your symptoms even when difficult?	0.69
10. Evaluate how well a remedy works?	0.67

specific residual covariances to account for methodological artifacts inherent in the scale structure. Most of these covariances addressed adjacent item pairs (items 8–9, 2–3, 4–5, and 6–7), consistent with the proximity effect documented by Weijters et al. (2009), wherein positively worded adjacent items exhibit correlated residuals that diminish with increased item distance (Weijters et al., 2009; Yu et al., 2021). Additional covariances for nonadjacent pairs (items 7–10) were justified by shared item wording characteristics, representing methodologically sound corrections for systematic measurement error.

The final model demonstrated an acceptable to excellent fit across multiple indices: $\chi^2(34) = 92.23, p < .001$; RMSEA = 0.06 (90% CI = 0.05–0.08); CFI = 0.96; TLI = 0.94; SRMR = 0.06. These values meet established benchmarks for multidimensional self-care instruments, with RMSEA below the 0.08 threshold indicating good approximation, CFI and TLI exceeding 0.90 demonstrating adequate incremental fit, and SRMR well below 0.08 suggesting excellent absolute fit. All factor loadings were statistically significant, supporting the theoretical coherence of the unidimensional structure.

Reliability analyses revealed exceptional internal consistency. McDonald’s omega ($\omega = 0.90$) exceeded conventional thresholds, while composite reliability (CR = 0.88) and factor score determinacy ($\lambda = 0.92$) demonstrated robust measurement precision. These reliability estimates align with findings from comparable chronic illness populations (De Maria et al., 2021;

Riegel et al., 2018; Vellone et al., 2020), confirming the psychometric integrity for patients with IBD.

The total correlations ranged from 0.49 (item 1) to 0.72 (item 5), all surpassing the minimum criterion for adequate item discrimination. The slight weakness of item 1 in our IBD sample, compared with the version validated in the Italian chronic population by Yu (factor loading = 0.684) (Yu et al., 2021), may be explained by its negative kurtosis (–0.65), suggesting a more uniform distribution of responses within our cohort. This finding could reflect the specific challenges faced by individuals with IBD in recognizing, managing, and experiencing relief from the multiplicity of symptoms associated with the condition (Huisman et al., 2024; Parigi et al., 2023). A more detailed item capturing the nature and variability of IBD-related symptoms might improve its correlation with the overall construct.

A distinctive advantage of this instrument is its brevity in relation to existing IBD-specific self-efficacy measures. Unlike validated SC-SES scales in other languages comprising 29 items (Keefer et al., 2011; Sheehan et al., 2023; Tanaka et al., 2023), our 10-item version improves practical utility while maintaining psychometric rigour. This reduced length minimizes respondent burden and completion time, potentially improving response rates and feasibility for routine clinical assessment. These advantages parallel efforts by Tanaka et al. (2024), who similarly developed a shortened 13-item version of the original IBD self-efficacy scale to address practical implementation concerns (Tanaka et al., 2024).

This instrument represents the first internationally validated, short-form, unidimensional self-efficacy scale specifically designed for self-care assessment in IBD patients. The rigorous psychometric evaluation, incorporating methodologically justified model modifications, provides a theoretically sound and practically feasible option for routine clinical evaluation and research applications. The scale addresses the documented need for efficient disease-specific measurement tools in the management of self-care of IBD while maintaining the theoretical foundation established by the Middle-Range Theory of Chronic Illness.

Limitations

Several limitations should be recognized. First, although participants were recruited across multiple clinical centers, the study sample consisted of individuals receiving care in outpatient settings, which may limit the generalizability of the findings to IBD populations managed in other healthcare settings. Second, the use of self-reported measures introduces the potential for response bias, particularly in the evaluation of behaviors such as exercise, dietary habits, and adherence

to treatment. Third, the cross-sectional nature of the study excludes conclusions about the predictive validity of the SC-SES or its sensitivity to change over time.

Implications for Gastroenterology Nurses

The validated SC-SES offers gastroenterology nurses a brief and reliable tool to assess patients' confidence in performing self-care behaviors (Napolitano et al., 2025b). Its use in routine practice can help identify individuals with low self-efficacy who may be at risk for poor adherence, inadequate symptom monitoring, or delayed response to disease exacerbations. The scale's brevity enhances feasibility in outpatient settings and supports tailored education, behavioral coaching, and shared decision-making. Longitudinal assessment may also assist nurses in evaluating the impact of self-care interventions and optimizing personalized care plans.

Implications for Future Research

Future studies should examine the predictive validity and responsiveness of the SC-SES in IBD populations. Longitudinal research is needed to determine whether self-care self-efficacy predicts clinical outcomes such as flares, hospitalizations, and QoL. Intervention studies should evaluate whether nurse-led programs improve SC-SES scores and related patient outcomes. Further investigation of measurement invariance across clinical subgroups would strengthen the scale's generalizability.

Conclusions

The SC-SES provides health care providers with a structured and evidence-based instrument for assessing self-efficacy in IBD patients. It can be used in routine clinical practice to identify patients with low self-efficacy and guide targeted interventions that improve disease self-management. Additionally, it has the potential to support patient education programs, behavioral coaching, and personalized care planning, ultimately improving adherence, symptom control, and QoL. By measuring self-efficacy longitudinally, clinicians can track the impact of therapeutic or educational interventions and refine their strategies in real time.

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REFERENCES

- Achury-Saldaña, D., Duran De-Villalobos, M. M., & Fuentes-Ramirez, A. (2025). Self-efficacy in people with chronic disease: An evolutionary concept analysis. *Nursing Open*, 12(7), e70276. doi:10.1002/nop.2.70276
- Andersson, S., Granat, L., Brannstrom, M., & Sandgren, A. (2022). Translation, cultural adaptation, and content validation of the palliative care self-efficacy scale for use in the swedish context. *International Journal of Environmental Research and Public Health*, 19(3), 1143. doi:10.3390/ijerph19031143
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215. doi:10.1037//0033-295x.84.2.191
- Bonsaksen, T., Lerdal, A., & Fagermoen, M. S. (2012). Factors associated with self-efficacy in persons with chronic illness. *Scandinavian Journal of Psychology*, 53(4), 333–339. doi:10.1111/j.1467-9450.2012.00959.x
- Cesario, J., & McDonald, M. M. (2013). Bodies in context: Power poses as a computation of action possibility. *Social Cognition*, 31(2), 260–274. doi:10.1521/soco.2013.31.2.260
- Chen, L., Gu, L., Li, X., Chen, W., & Zhang, L. (2022). Translation, cross-cultural adaptation, and validation of the Chinese version of self-efficacy and attitudes for providing Mouth Care scale. *PLoS One*, 17(7), e0271800. doi:10.1371/journal.pone.0271800
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. doi:10.1207/s15328007sem0902_5
- Chica-Perez, A., Dobarrio-Sanz, I., Correa-Casado, M., Fernandez-Sola, C., Ruiz-Fernandez, M. D., & Hernandez-Padilla, J. M. (2023). Spanish version of the self-care self-efficacy scale: A validation study in community-dwelling older adults with chronic multimorbidity. *Geriatric Nursing*, 53, 181–190. doi:10.1016/j.gerinurse.2023.07.016
- Crocker, L., & Algina, J. (2008). *Introduction to classical and modern test theory*. Cengage Learning. ISBN: 978-0-495-39591-1. Google Books e WorldCat registrano l'edizione Cengage Learning del 2008
- De Maria, M., Iovino, P., Lorini, S., Ausili, D., Matarese, M., & Vellone, E. (2021). Development and psychometric testing of the caregiver self-efficacy in contributing to patient self-care scale. *Value in Health*, 24(10), 1407–1415. doi:10.1016/j.jval.2021.05.003
- Dragasevic, S., Stankovic, B., Kotur, N., Sokic Milutinovic, A., Nikolic, A., Pavlovic, S., & Popovic, D. (2025). Psychological distress is associated with inflammatory bowel disease manifestation and mucosal inflammation. *Inflammatory Bowel Diseases*, 31(6), 1567–1573. doi:10.1093/ibd/izae180
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. doi:10.2307/3151312
- Herrero-Hahn, R., Rojas, J. G., Ospina-Diaz, J. M., Montoya-Juarez, R., Restrepo-Medrano, J. C., & Hueso-Montoro, C. (2017). Cultural adaptation and validation of the cultural self-efficacy scale for Colombian nursing professionals. *Journal of Transcultural Nursing*, 28(2), 195–202. doi:10.1177/1043659615613419
- Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. doi:10.1080/10705519909540118
- Huisman, D., Burrows, T., Sweeney, L., Bannister, K., & Moss-Morris, R. (2024). 'Symptom-free' when inflammatory bowel disease is in remission: Expectations raised by online resources. *Patient Education and Counseling*, 119, 108034. doi:10.1016/j.pec.2023.108034

- Kaplan, G. G., & Windsor, J. W. (2021). The four epidemiological stages in the global evolution of inflammatory bowel disease. *Nature Reviews Gastroenterology and Hepatology*, 18(1), 56–66. doi:10.1038/s41575-020-00360-x
- Keefer, L., Kiebles, J. L., & Taft, T. H. (2011). The role of self-efficacy in inflammatory bowel disease management: Preliminary validation of a disease-specific measure. *Inflammatory Bowel Diseases*, 17(2), 614–620. doi:10.1002/ibd.21314
- Kelley, K., & Pornprasertmanit, S. (2016). Confidence intervals for population reliability coefficients: Evaluation of methods, recommendations, and software for composite measures. *Psychological Methods*, 21(1), 69–92. doi:10.1037/a0040086
- Khan, S., Sebastian, S. A., Parmar, M. P., Ghadge, N., Padda, I., Keshta, A. S., Minhaz, N., & Patel, A. (2024). Factors influencing the quality of life in inflammatory bowel disease: A comprehensive review. *Disease-a-Month*, 70(1S), 101672. doi:10.1016/j.disamonth.2023.101672
- Kline, R. B. (2023). Structural equation modeling in neuropsychology research. In G. G. Brown, B. Crosson, K. Y. Haaland, & T. Z. King (Eds.), *APA handbook of neuropsychology: Neuroscience and neuromethods* (pp. 681–698). American Psychological Association. doi:10.1037/0000308-034
- Kres, H. (1983). The mardia-test for multivariate normality, skewness, and kurtosis: tables. In K. V. Mardia (Ed.), *Statistical tables for multivariate analysis*. Springer Series in Statistics. Springer. doi: 10.1007/978-1-4612-5609-0_27
- Lv, Q., Zhang, X., Wang, Y., Xu, X., & Zang, X. (2024). Cross-cultural adaptation and validation of the caregiver self-efficacy in contributing to patient self-care scale in China. *BMC Public Health*, 24(1), 1977. doi:10.1186/s12889-024-19534-2
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. doi:10.1037/1082-989x.1.2.130
- Muthén, L. K., & Muthén, B. O. (2017). *Mplus: statistical analysis with latent variables: User's guide (Version 8)*. Authors.
- Napolitano, D., Vellone, E., Iovino, P., Scaldaferrì, F., & Cocchieri, A. (2024). Self-care in patients affected by inflammatory bowel disease and caregiver contribution to self-care (IBD-SELF): A protocol for a longitudinal observational study. *BMJ Open Gastroenterology*, 11(1), e001510. doi:10.1136/bmjgast-2024-001510
- Napolitano, D., Biagioli, V., Bartoli, D., Cilluffo, S., Martella, P., Monaci, A., Vellone, E., & Cocchieri, A. (2025a). Validity and reliability of the self-care of chronic illness inventory in patients living with inflammatory bowel disease. *Journal of Clinical Nursing*, 34(11), 4642–4653. doi:10.1111/jocn.17712
- Napolitano, D., Scaldaferrì, F., Leone, S., Previtali, E., Fiorino, G., Caprioli, F., Fantini, M. C., Radice, S., Lorenzon, G., & Schiavoni, E.; Nurse IGBD Group. (2025b). The dedicated inflammatory bowel disease nurse, if you know them, you love them: Survey of the Italian IBD Patients' Association. *Crohn's and Colitis* 360, 7(4), otaf063. doi:10.1093/crocol/otaf063
- Nunnally, J. C., & Bernstein, I. H. (1994). The assessment of reliability. *Psychometric Theory*, 3, 248–292.
- Parigi, T. L., D'Amico, F., Abreu, M. T., Dignass, A., Dotan, I., Magro, F., Griffiths, A. M., Jairath, V., Iacucci, M., Mantzaris, G. J., O'Morain, C., Reinisch, W., Sachar, D. B., Turner, D., Yamamoto, T., Rubin, D. T., Peyrin-Biroulet, L., Ghosh, S., & Danese, S. (2023). Difficult-to-treat inflammatory bowel disease: Results from an international consensus meeting. *Lancet Gastroenterology and Hepatology*, 8(9), 853–859. doi:10.1016/S2468-1253(23)00154-1
- Revelle, W., & Zinbarg, R. E. (2009). Coefficients alpha, beta, omega, and the glb: Comments on sijtsma. *Psychometrika*, 74(1), 145–154. doi:10.1007/s11336-008-9102-z
- Riegel, B., Jaarsma, T., & Stromberg, A. (2012). A middle-range theory of self-care of chronic illness. *Advances in Nursing Science*, 35(3), 194–204. doi:10.1097/ANS.0b013e318261b1ba
- Riegel, B., Barbaranelli, C., Sethares, K. A., Daus, M., Moser, D. K., Miller, J. L., Haedtke, C. A., Feinberg, J. L., Lee, S., Stromberg, A., & Jaarsma, T. (2018). Development and initial testing of the self-care of chronic illness inventory. *Journal of Advanced Nursing*, 74(10), 2465–2476. doi:10.1111/jan.13775
- Riegel, B., Westland, H., Iovino, P., Barelds, I., Bruins Slot, J., Stawnychy, M. A., Osokpo, O., Tarbi, E., Trappenburg, J. C. A., Vellone, E., Strömberg, A., & Jaarsma, T. (2021). Characteristics of self-care interventions for patients with a chronic condition: A scoping review. *International Journal of Nursing Studies*, 116, 103713. doi:10.1016/j.ijnurstu.2020.103713
- Şahin, M., & Aybek, E. (2020). Jamovi: An easy to use statistical software for the social scientists. *International Journal of Assessment Tools in Education*, 6(4), 670–692. doi:10.21449/ijate.661803
- Sheehan, J. L., Greene-Higgs, L., Swanson, L., Higgins, P. D. R., Krein, S. L., Waljee, A. K., Saini, S. D., Berinstein, J. A., Mellinger, J. L., Piette, J. D., Resnicow, K., & Cohen-Mekelburg, S. (2023). Self-efficacy and the impact of inflammatory bowel disease on patients' daily lives. *Clinical and Translational Gastroenterology*, 14(6), e00577. doi:10.14309/ctg.0000000000000577
- Tabachnick, B., & Fidell, L. (2013). *Using multivariate statistics*. Pearson Education Inc.
- Tanaka, J. W., & Farah, M. J. (1993). Parts and wholes in face recognition. *Quarterly Journal of Experimental Psychology A*, 46(2), 225–245. doi:10.1080/14640749308401045
- Tanaka, M., Kawakami, A., Sakagami, K., Terai, T., Fernandez, J., Keefer, L., & Ito, H. (2023). Development and validation of a Japanese version of the Inflammatory Bowel Disease Self-efficacy Scale and cross-culture study in Japan and the United States. *Inflammatory Bowel Diseases*, 29(8), 1210–1216. doi:10.1093/ibd/izac196
- Tanaka, M., Kawakami, A., Sakagami, K., Terai, T., Fernandez, J., Keefer, L., & Ito, H. (2024). Development and validation of a 13-item short version of the Inflammatory Bowel Disease Self-efficacy Scale. *BMC Gastroenterology*, 24(1), 190. doi:10.1186/s12876-024-03206-x
- Vellone, E., Barbaranelli, C., Pucciarelli, G., Zeffiro, V., Alvaro, R., & Riegel, B. (2020). Validity and reliability of the caregiver contribution to Self-care of Heart Failure Index version 2. *Journal of Cardiovascular Nursing*, 35(3), 280–290. doi:10.1097/JCN.0000000000000655
- Weijters, B., Geuens, M., & Schillewaert, N. (2009). The proximity effect: The role of inter-item distance on reverse-item bias. *International Journal of Research in Marketing*, 26(1), 2–12. doi:10.1016/j.ijresmar.2008.09.003
- Weijters, B., Cabooter, E., & Schillewaert, N. (2010). The effect of rating scale format on response styles: The number of response categories and response category labels. *International Journal of Research in Marketing*, 27(3), 236–247. doi:10.1016/j.ijresmar.2010.02.004

- Yu, D. S., De Maria, M., Barbaranelli, C., Vellone, E., Matarese, M., Ausili, D., Rejane, R. E., Osokpo, O. H., & Riegel, B. (2021). Cross-cultural applicability of the Self-Care Self-Efficacy Scale in a multi-national study. *Journal of Advanced Nursing*, 77(2), 681–692. doi:10.1111/jan.14617
- Zinbarg, R. E., Revelle, W., Yovel, I., & Li, W. (2005). Cronbach's α , revelle's β , and Mcdonald's ω_H : Their relations with each other and two alternative conceptualizations of reliability. *Psychometrika*, 70(1), 123–133. doi:10.1007/s11336-003-0974-7