

Table 1: Description of the instruments used in the study

Instrument	Number of items	Administered to	Score range	Higher scores means	Validity Original Study	Validity Italian Study	Reliability Original Study	Reliability Italian Study	Timing of data collection
Questionnaire	33	P-C	NA	NA	NA	NA	NA	NA	Baseline
CCI	19	P	0-36	More comorbidities↑	The CCI effectively predicted mortality, stratified patients by comorbidity risk, and showed significant predictive ability. Lower comorbidity prevalence in the training population and higher 1-year survival rates supported its validity.	NA	The CCI demonstrates strong inter-rater reliability. Studies report high agreement levels: 58% absolute agreement among 5 raters, intraclass correlation coefficient of 0.80 among 4 raters, and kappa of 0.93 between 2 raters.	NA	Baseline
SILS	1	P	1-5	Health literacy ↓	The SILS had a sensitivity of 54% and a specificity of 83% in detecting limited reading ability, as measured by the reference test (S-TOFHLA). The area under the Receiver Operating Characteristics (ROC) curve for the SILS was 0.73, indicating moderately good performance in discriminating between those with and without limited reading ability.	The SILS score greater than 2 had a sensitivity of 67% and a specificity of 82% for detecting subjects with the lowest reading ability (S-TOFHLA scores less than 16 or physically unable to complete the test). However, the SILS performed less well in identifying those with marginal reading ability (S-TOFHLA scores 17-22).	NA	NA	Baseline, T1, T2
MMAS-8	8	P	0-8	Medication Adherence↑	The MMAS-8 was found to have good concurrent and predictive validity. It was significantly associated with blood pressure control.	The MMAS-8 is generally considered valid across diverse patient populations and treatment contexts	The reliability of the MMAS-8 was confirmed with a Cronbach's alpha reliability score of 0.83, indicating good internal consistency	The MMAS-8 in this context, the scale is typically considered reliable for assessing medication adherence.	Baseline, T1, T2
NPM-CI	20	P	20-100	Mutuality between patient, and nurse↑	The validity of the NPM-CI was supported based on strong content validity, construct, and predictive validity		The internal reliability and test-retest stability were supported in the population of nurses and patients with chronic disease, indicating strong reliability: Cronbach's α : 0.90		Baseline, T1, T2

ZBI	22	C	0-88	Caregiver burden [†]	The ZBI demonstrated, construct and internal consistency validity	The ZBI demonstrated good validity. Confirmatory factor analysis supported a two-factor structure explaining 41% of the variance. Convergent validity was evidenced by significant positive correlations with anxiety and depression	The ZBI showed high internal consistency (Cronbach's α between 0.85 and 0.93) and good test-retest reliability	The ZBI showed high internal consistency (Cronbach's $\alpha = 0.89$) and good test-retest reliability over 2 weeks (ICC = 0.86). Item-total correlations ranged from 0.26 to 0.72, indicating items have adequate relationships with overall scale.	Baseline, T1, T2
DASS-21	21 Total 7 (Depression) 7 (Anxiety) 7 (Stress)	P-C	Depression 0-27 Anxiety 0-19 Stress 0-33	Depression, anxiety, and stress [†]	The DASS-21 show strong convergent validity. Confirmatory and exploratory factor analysis further attest to the structural validity of the scale, proving that the scales align well with the theoretical constructs they aim to measure	The DASS-21 shows good validity, including convergent and divergent validity with similar constructs	The reliability of the original version is confirmed through various forms of analysis including principal components and confirmatory factor analysis (Cronbach's alpha value of at least 0.70)	The DASS-21 shows good reliability with high internal consistency values for the subscales and total scores in both community and clinical samples: Anxiety ($\alpha=0.88$), Depression ($\alpha=0.91$), Stress ($\alpha=0.83$), Total ($\alpha=0.92$), indicating strong consistency and reliability across different groups	Baseline, T1, T2
Dyadic Care-Types Scale	2	P-C	Four category of dyadic	Patient and caregiver symptom management and satisfaction with symptom management [†]	NA	NA	NA	Inter-rater reliability kappa = 0.28; p = 0.025	Baseline, T1, T2
MS	15	P-C	0-60	Quality of the relationship between patient and caregiver [†]	The MS scale has good validity for assessing the constructs of interest	The MS found that the factorial structure of the scale was valid, with a four-factor model providing a good fit to the data. This supports the use of the MS as a valid measure of mutuality	The original MS demonstrated adequate reliability, with Cronbach's alpha exceeding 0.70 for 9 out of the 10 multi-item scales. The correlation between 6-week and 9-month scores on the Strain from Mismatched Expectations scale was 0.67, providing additional evidence of reliability	The internal consistency reliability of the MS, factors and total scale was assessed and found to be acceptable, with Cronbach's alpha values ranging from 0.871 to 0.952 for the patient and caregiver versions. This indicates the MS has good reliability.	Baseline, T1, T2
MSPSS	12	P-C	12- 84	Perceived social support from family, friends, and other important individuals [†]	The study demonstrated that the MSPSS has good internal and	The MSPSS has demonstrated good validity in this study. Confirmatory factor	The MSPSS displayed good internal consistency, with Cronbach's	The MSPSS showed excellent internal consistency reliability, with Cronbach's alpha	Baseline, T1, T2

					test-retest validity, indicating it is a psychometrically sound instrument for measuring subjective social support.	analysis supported the three-factor structure of Family, Friends, and Significant Others. The MSPSS subscale scores were significantly correlated with related measures of social support, indicating convergent validity	alpha values of 0.91, 0.87, and 0.85 for the Significant Other, Family, and Friends subscales respectively. The overall scale reliability was 0.88, suggesting the MSPSS is a reliable measure	coefficients over 0.90 for the total scale and the three subscales. This suggests the MSPSS is a reliable instrument to measure perceived social support in patients with chronic diseases.	
SC-CII	19	P	0–100 for each scale	Self-care behaviors of patients with chronic conditions↑	The SC-CII was developed based on the Middle Range Theory of Self-Care of Chronic Illness and underwent content validity testing with an expert panel. Confirmatory factor analysis supported the factorial validity of the three scales, with the Self-Care.	The validity of the SC-CII was assessed through psychometric testing, which demonstrated adequate content validity. This supports its use for measuring self-care behaviors in chronically ill individuals across different cultural groups.	The internal consistency reliability, as measured by Cronbach's alpha and composite reliability, was adequate for the Self-Care Monitoring scale ($\alpha = 0.81$) and the Self-Care Management scale ($\alpha = 0.71$). The SC-CII had a slightly lower internal consistency ($\alpha = 0.67$), likely due to the multidimensional nature of the scale.	The SC-CII showed adequate internal consistency (Cronbach's alpha = 0.67) and test-retest reliability, indicating it is a reliable instrument for measuring self-care	Baseline, T1, T2
SC-SES	10	P	0-100	Self-efficacy of the patients in performing self-care↑	The SC-SES was developed using a strong theoretical basis to measure an individual's beliefs about their ability to manage chronic illness. Validity and reliability were established through a series of rigorous analyses, including confirmatory factor analysis and evaluation of the factor structure across the four populations.		The internal consistency of the SCSES was assessed using Cronbach's alpha. The alpha coefficients were 0.938, 0.907, 0.911, and 0.894 for the United States, China (Hong Kong), Italy, and Brazil, respectively. These high Cronbach's alpha values indicate the SCSES has excellent reliability across the four cultural groups		Baseline, T1, T2
CC-SCCII	19	C	0-100 for each scale	Caregiver contribution to self-care in chronic illness↑	The CC-SC-CII was shown to be a valid instrument for measuring caregiver contributions to self-care in chronic illnesses. Confirmatory factor analysis supported the factorial structure, and the scales demonstrated good internal consistency. It accurately measures the intended constructs of caregiver contribution to self-care in heart failure patients.		The reliability of the CC-SC-CII scales ranged from 0.82 to 0.96, with Cronbach's alpha coefficients indicating good internal consistency. The global reliability index for the multidimensional scales was also supportive, meaning the scale consistently and dependably measures the constructs it is intended to assess.		Baseline, T1, T2
CSE-CSC	10	C	0-100	Caregiver self-efficacy in contributing to patient self-care of chronic illness↑	The CSE-CSC scale demonstrated good construct validity, as shown by the significant correlations between the scale scores and various related factors, such as the caregiver's		The CSE-CSC scale exhibited high internal consistency reliability, with composite reliability coefficients ranging from 0.90 to 0.95 for the different factors. This indicates that the items		Baseline, T1, T2

					ability to manage the patient's illness and symptoms. The scale was validated using both exploratory and confirmatory factor analysis, which confirmed the hypothesized factor structure.		within the scale consistently measure the same underlying constructs.		
Brief-IPQ	9	P	0-80 Item 9: The patient responses to the causal item can be grouped into categories	Cognitive and emotional representations of illness↑	The Brief-IPQ demonstrated good discriminant validity, allowing it to distinguish between different illness groups. The scale was able to identify distinct patient beliefs in these groups, even for illnesses with similar timeline perceptions.	The Italian version of Brief IPQ demonstrated good discriminant validity.	The test-retest reliability of the Brief IPQ was assessed in a renal sample over 3-week and 6-week intervals. The reliability coefficients (alpha values) ranged from 0.70 to 0.86, indicating good test-retest reliability over both time periods.	The Brief IPQ was assessed Cronbach's: high reliability, and adaptability	Baseline, T1, T2
SF-12	12	P-C	0-100	Quality of life↑	The SF-12 achieved multiple R squares of 0.911 and 0.918 in predicting the SF-36 PCS and MCS scores, respectively. Scoring algorithms from the general population achieved R squares of 0.905 with the SF-36 PCS and 0.938 with the SF-36 MCS when cross-validated in the Medical Outcomes Study. Relative validity estimates for the 12-item PCS ranged from 0.43 to 0.93 (median = 0.67) in comparison with the best 36-item short-form scale. Relative validity estimates for the 12-item MCS ranged from 0.60 to 1.07 (median = 0.97) in relation to the best 36-item short-form scale.	The SF-12 has been tested in nine Western European countries and has shown good validity, comprehensiveness, and cross-cultural applicability. In the Italian settings, the SF-12 showed a positive association between PCS and MCS scores and their respective items across all examined samples. MCS scores were fairly similar across all samples, except for patients recently discharged from the hospital, who had higher than expected MCS scores (52.2). Ageing had a substantial impact on physical health perception (PCS), while the MCS was less sensitive to the age effect	In original SF-12 demonstrated the test-retest (2-week) correlations of 0.89 for the 12-item PCS and 0.76 for the 12-item MCS were observed in the general US population.	The SF-12 demonstrated good reliability in various Italian settings, including the general population and specific patient groups.	Baseline, T1, T2

CD-RISC 25	25	P-C	0-100	Resilience↑	The CD-RISC is shown good convergent validity correlating CD-RISC scores with measures of hardiness, perceived stress, and disability, showing significant correlations in the expected directions	The Italian version of the CD-RISC has demonstrated good construct validity, with significant correlations between CD-RISC scores and other measures of resilience, psychological well-being, and perceived stress. The scale has shown strong correlations with other measures of resilience and psychological adaptation, indicating that it effectively measures the construct of resilience. The scale has been able to distinguish between groups with known levels of resilience, such as individuals with and without psychological disorders.	The CD-RISC demonstrated good internal consistency, with a Cronbach's alpha of 0.89 for the full scale.	The Italian version of the CD-RISC has shown high internal consistency, with Cronbach's alpha values typically above 0.80, indicating that the items on the scale are consistent with each other. Test-retest correlation values are generally above 0.70.	Baseline, T1, T2
9-item PAC	9	C	9-45	Positive feelings resulting from caregiver contributions to self-care. ↑	The structural, convergent, and divergent validity of the PAC scale were established through confirmatory factor analysis and examination of the scales' relationships with other measures. The PAC scale demonstrated good fit indices, supporting its validity as a measure of the positive aspects of caregiving.	NA	The 9-item PAC scale showed high internal consistency, with Cronbach's alpha values (0.92). The test-retest reliability of the scales was also assessed, indicating that are reliable measures over time.	NA	Baseline, T1, T2

Abbreviations. ↑, going up; ↓, going down; P, patient; C, caregiver; NA, not applicable; UC, Ulcerative Colitis; CD, Crohn's Disease; CCI, Charlson Comorbidity Index; SILS, Single-item Literacy Screener; MMAS, Morisky Medication Adherence Scale; NPM-CI, Nurse-Patient Reciprocity in Chronic Disease; ZBI, Zarit Burden Inventory; DASS-21, Depression Anxiety Stress Scales 21; MS, Mutuality Scale; MSPSS, Multidimensional Scale of Perceived Social Support; SC-CII, Self-Care of Chronic Illness Index; SC-SES, Self-care Self-Efficacy Scale; CC-SCCII, Caregiver Contribution to Self-care of Chronic Illness Inventory; CSE-CSC, Caregiver Self-Efficacy in Contributing to Patient Self-Care; Brief-IPQ, Brief-Illness Perception Questionnaire; SF-12, Short Form-12; CD-RISK25, Connor-Davidson Resiliency Scale; 9-item PAC, 9-item Positive Aspects of Caregiving scale;

