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ORIGINAL RESEARCH

The Psychometric Properties of the Turkish Version of the Ostomy Self-Care Index and the Caregiver Contribution to Self-Care in Ostomy Patient Index

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Abstract

Background: Living with an ostomy is a chronic condition, and self-care in such cases improves patient outcomes. **Purpose:** To adapt and test the psychometric properties of the Turkish version of the Ostomy Self-Care Index (T-

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range of 0.85 to 1 for both the T-OSCI and the T-CC-OSCI. Exploratory factor analysis demonstrated generally acceptable factor loadings. The overall index revealed a high level of internal consistency (T-OSCI = 0.968, T-CC-OSCI = 0.862). No statistically significant difference was found between test-retest measurements. There was no indication of either ceiling or floor effects, or response bias. **Conclusion:** The T-OSCI and the T-CC-OSCI are valid and reliable indexes to measure the self-care of patients with an ostomy and their caregivers. These indexes may allow health care professionals to evaluate self-care in research and clinical settings, identify educational needs, and collaborate in developing and supporting appropriate self-care initiatives for patients with an ostomy and their caregivers.

Abbreviations

CC-OSCI, Caregiver Contribution to Self-Care in Ostomy Patient Index; CI, confidence interval; CVI, content validity index; EFA, exploratory factor analysis; ICC, intraclass correlation coefficient; KMO, Kaiser-Meyer-Olkin; OSCI, Ostomy Self-Care Index; SD, standard deviation; T-CC-OSCI, Turkish version of the Caregiver Contribution to Self-Care in Ostomy Patient Index; T-OSCI, Turkish version of the OSCI.

Background

An *ostomy* is a surgically extracted opening, either permanent or temporary, in the abdominal surface for the elimination of stool or urine.[1] A patient undergoing ostomy surgery—whether temporary or permanent—encounters multiple challenges, lifelong consequences, and lifestyle changes. Changes in physical and personal conditions associated with ostomy creation may cause difficulties in adaptation to the ostomy, and may adversely affect the individual's psychosocial balance and body image.[2,3]

Living with an ostomy is a chronic condition, and self-care in such cases improves patient outcomes. *Self-care* has been defined as "the process of health promotion practices and maintaining health through the management of diseases."[4] The concept of self-care for patients with an ostomy involves the core elements of middle range Theory of Self-Care of Chronic Illness: maintenance, monitoring (ie, follow-up), management, and self-efficacy.[4] Maintaining self-care is a decision-making process that determines actions linked to stoma and peristomal skin physiological stability. *Self-care monitoring* involves the detection of stoma-related problems and complications. The process of dealing with these issues and complications is known as *self-care management*. *Self-care confidence* or *self-efficacy* is the patient's ability to participate effectively in stoma self-care.[5-7]

The majority of ostomy-related care tasks are carried out at home by the patients themselves and by caregivers, who often are family members. The *caregiver contribution* to the patient's self-care can be defined as providing time, effort, and support to perform self-care on behalf of another person. Contributions to self-care by caregivers range from advising the patient to providing the self-care when patients are unable to care for themselves.[6,8] Family behaviors are especially important for patients with an ostomy who require active self-management on an ongoing basis. Furthermore, family members frequently assist patients in performing self-management duties, making disease-related decisions, and coping with ostomy-related stress. It also has been reported that patients with an ostomy who have higher levels of family support benefit from better disease management, better control of their chronic conditions, lower hospitalization rates, and greater satisfaction with their medical care.[9]

Self-care has been found to be associated with better quality of life,[2] better adjustment to ostomy,[3] and reduced hospital readmissions[10] in patients with an ostomy. However, as of this writing, studies on ostomy self-care have described only partial aspects of self-care,[11-15] and in several studies ostomy self-care has been only partially assessed, with no clear definition (eg, self-care abilities) and with the use of questionnaires or checklists that lack robust psychometric features.[2,3,10]

specific educational interventions, and evaluate the role of caregivers. Currently, there is no specific measurement tool in Turkey to determine the level of self-care in patients with an ostomy. However, the following tools exist: the Specific Self-Care for Ostomized Patients (CAESPO) Questionnaire, first developed by Collado-Boira et al[17] to assess the self-care level of patients with ostomy, and the OSCI and the CC-OSCI to measure self-care, developed by Villa et al.[5]

The OSCI consists of 32 items grouped into 4 sections and scored using 5-point Likert scales: self-care maintenance (1 = "never," 5 = "always"), self-care monitoring (1 = "never," 5 = "always"), self-care management (1 = "not quickly," 5 = "very quickly"), and self-care confidence (1 = "not confident," 5 = "extremely confident"). The CC-OSCI consists of 22 items grouped into 3 sections and scored using 5-point Likert scales: self-care maintenance (1 = "never," 5 = "always"), self-care monitoring (1 = "never," 5 = "always"), and self-care management (1 = "not quickly," 5 = "very quickly").[5] The OSCI and CC-OSCI indexes are quicker and easier to implement, easier to understand, and have good psychometric values.[5]

The current study aimed to adapt and test the psychometric properties of the T-OSCI and the T-CC-OSCI. These indexes could allow health care professionals to evaluate self-care in research and clinical settings, identify educational needs, and collaborate on developing and supporting appropriate self-care initiatives for patients with an ostomy and their caregivers.

Methods

Design

The T-OSCI and the T-CC-OSCI were tested using a psychometric study method. The findings were presented according to health status questionnaire quality standards.[18] The OSCI and the CC-OSCI were both translated into Turkish and then back to English. Following that, the face and content validity of the T-OSCI and the T-CC-OSCI were assessed, after which construct validation and reliability were assessed for both.

Linguistic validation

First, permission was obtained from one of the scale's developers and researchers (Giulia Villa, PhD, RN) to translate and evaluate the validation of the scale for use in the Turkish population. Second, all 4 authors of the current study translated the original OSCI and CC-OSCI from English to Turkish, reviewed each item, and, if necessary, adjusted to ensure conceptual equivalence, meaningfulness, and linguistic accuracy. This process was done in accordance with reported principles of instrument translation.[19] Third, a professional bilingual translator unfamiliar with the original indexes translated them from Turkish back to English. The research team compared the back-translated forms with the originals, and Dr. Villa also confirmed the acceptability of the final versions.

The face validity of the measurement tools aids in determining whether the items are meaningful and relevant to the intended population.[20-23] Face validity was evaluated with 7 patients with an ostomy and their 5 caregivers. The researchers prepared a form that was anonymous and asked the following questions: 1) What are your thoughts on the index in general? 2) What are your thoughts on each of the statements? 3) How long did it take to finish this index? 4) Is the number of questions sufficient? 5) Do you agree with the order of the questions? 6) Did you have any difficulty understanding or responding to any of the questions? 7) Did you have any difficulty understanding or responding to one of the questions? 8) Have there been any difficulties with how the statements were rated? 9) Do you have any further recommendations regarding the index?

Content validity was then assessed by 7 experts: 5 nurse academics (3 experts in psychometrics, 1 in both ostomy nursing and psychometric studies, and 1 in surgical nursing), and 2 physicians with expertise in colorectal surgery. The experts' opinions were evaluated using the CVI. Experts used a 4-point Likert scale to rate each item (1 = "inappropriate"; 2 = "somewhat appropriate, it must be seriously reviewed"; 3 = "appropriate, it should be checked"; 4 = "appropriate").

Construct validation and reliability assessment of the T-OSCI and the T-CC-OSCI

Setting and sample. The current study was conducted in western Turkey between February 2021 and September 2022. The measurement tool's validity and reliability studies' recommended sample sizes are between 5 and 10 times the scale's item count.[21] The convenience sample was composed of 202 adult patients with an ostomy and 165 caregivers (N = 367). Data were collected from patients with an ostomy and their caregivers during patients' routine control visits. The inclusion criteria for patients with a stoma were as follows: opening a stoma due to planned or emergency surgery at least 1 month previously (ileostomy, colostomy, urostomy), age 18 years or older, ability to understand and speak Turkish, and consenting to take part

included a descriptive data form and the T-CC-OSCI.

Ostomy Self-Care Index. As mentioned previously, there are 4 sections in the OSCI, with a total of 32 items scored using 5-point Likert scales. Section A, self-care maintenance (ie, daily routine behaviors), consists of 9 items rated "1 = never" to "5 = always." The total score of section A is calculated thus: [(item 1 + item 2 + item 3 + item 4 + item 5 + item 6 + item 7 + item 8 + item 9)−9] × 2.778. Section B, self-care monitoring (ie, stoma and peristomal skin recognition), consists of 8 items rated "1 = never" to "5 = always." The total score of section B is calculated thus: [(item 10 + item 11 + item 12 + item 13 + item 14 + item 15 + item 16 + item 17)−8] × 3.125. Section C, self-care management (ie, problem recognition [if a stoma problem occurred, how quickly did the patient recognize it as such?] and response behaviors) consists of 5 items rated "1 = not quickly" to "5 = very quickly." The total score of section C is calculated thus: [(item 18 + item 19 + item 20 + item 21 + item 22)−5] × 5. Section D, self-care confidence (ie, confidence in the ability to engage effectively in self-care) has 10 items rated "1 = not confident" to "5 = extremely confident." The total score of section D is calculated thus: [(item 23 + item 24 + item 25 + item 26 + item 27 + item 28 + item 29 + item 30 + item 31 + item 32)−10] × 2.5. Overall scores from the scales range from 0 to 100.

Caregiver Contribution to Self-Care in Ostomy Patient Index. As mentioned previously, the CC-OSCI has 3 sections with a total of 22 items scored using 5-point Likert scales. Section A, caregiver contribution to self-care maintenance (ie, contribution to daily routine behaviors) consists of 9 items rated "1 = never" to "5 = always." The total score of section A is calculated thus: [(item 1 + item 2 + item 3 + item 4 + item 5 + item 6 + item 7 + item 8 + item 9)−9] × 2.778. Section B, caregiver contribution to self-care monitoring (ie, contribution to stoma and peristomal skin recognition) consists of 8 items rated "1 = never" to "5 = always." The total score of section B is calculated thus: [(item 10 + item 11 + item 12 + item 13 + item 14 + item 15 + item 16 + item 17)−8] × 3.125. Section C, caregiver contribution to self-care management (ie, contribution to problem recognition [if the patient had problems, how quickly did they recognize it as a stoma problem?] and

response behaviors) consists of 5 items rated "1 = not quickly" to "5 = very quickly." The total score of section C is calculated thus: [(item 18 + item 19 + item 20 + item 21 + item 22)−5] × 5. Scores from the scales range from 0 to 100. These scales have no reverse-scored items or cutoff points. Higher scores indicate that more self-care behaviors were reported.

Patients and their caregivers were informed of the study's purpose while waiting for patients' routine examination at the ostomy outpatient clinic. Surveys were filled out in a silent room by volunteer participants after receiving instructions from the researchers. The indexes were filled out independently by patients and caregivers. The survey included no personal information and took approximately 10 minutes to complete.

Data analysis

For this study, data were analyzed using SPSS v22 (IBM Corp). A 95% CI was used, with statistical significance set at $P < .05$.

For face validity, answers were analyzed descriptively. The CVI was used to evaluate the content validity of the expert opinions.[22–25] To evaluate (CVI for item), the number of experts who rated each item as "3" or "4" was divided by the total number of experts.

Exploratory factor analysis was used to evaluate construct validity. To determine whether the data were suitable for factor analysis, the KMO test and the Barlett test of sphericity were used. Factor structure was examined with exploratory principal axis factoring (PAF) with promax rotation and Kaiser normalization, and factor loadings of at least 0.30 were considered appropriate.[22,26,27] The validity of the final scales was determined using Cronbach α coefficients, ceiling and floor effects, the Hotelling T^2 test, and test-retest.[25,28]

Test-retest is used to determine the stability of a scale over time. The interval between the 2 tests should not be so brief that respondents can recall their responses from the first test, and it is recommended that 2 to 3 weeks pass between testings. The Wilcoxon test and the ICC were used to assess test-retest reliability.[25,28] To assess test-retest reliability in the current study, 2 to 3 weeks following the initial administration the T-OSCI and T-CC-OSCI were readministered to 24 adult patients with an ostomy and 27 caregivers who had expressed an interest in taking part in the retest. The floor and ceiling effects were calculated by adding the number who achieved the lowest possible score (ie, the floor), and the maximum possible score (ie, the ceiling). It was computed what proportion of these made up the entire sample.[24]

Results

Linguistic validation

All items were substantially identical to the originals after translation and back translation. The only change that was made was in item 4, in which the word *soap* was removed because it is not recommended for use in daily care.

Face validity testing was performed on 7 patients with a stoma and their 5 caregivers. The mean (SD) age of patients with stoma was 61.85 (12.01) years (range, 37–72 years), 57.10% (n = 4) were female, 42.9% (n = 3) were unemployed, and 71.4% (n = 5) reported that their income was equivalent to expenditure. The mean (SD) age of caregivers was 48.60 (7.09) years (range, 41–58 years), 40.0% (n = 2) were male, and 60.0% (n = 3) were unemployed. The T-OSCI and the T-CC-OSCI took approximately 10 minutes to complete. All participants agreed that the structure and number of questions was appropriate, and they had no issues scoring the statements. The majority of participants considered the scale relevant and understandable.

In the examination of content validity, the CVIs for the T-OSCI and the T-CC-OSCI were in the range of 0.85 to 1. Thus, at this point all of the items in the indexes were retained.

Construct validation and reliability assessment of the T-OSCI and the T-CC-OSCI

Most of the 202 patients with a stoma were male (63.9%, n = 129), and the mean (SD) patient age was 58.35 (13.78) years (range, 21–88 years). In addition, 71.8% (n = 145) of the patients were married, 55.5% (n = 112) had primary or secondary school education, 61.4% (n = 124) were retired, 43.1% (n = 87) reported that their income was equivalent to expenditure, and 53.0% (n = 107) had colostomy, 43.0% (n = 87) ileostomy, and 4.0% (n = 8) urostomy. The majority of patients (56.4%, n

= 114) had a temporary stoma, the mean (SD) time since the stoma was created was 23.22 (29.54) months, and 55.4% (n = 112) had other chronic diseases. In most cases, ostomy surgery was required for oncological cancer (66.9%, n = 135). Eighty patients (39.6%) self-reported that they were autonomous in stoma management.

Most of the 165 caregivers of patients with stoma were female (68.1%, n = 112), and the mean (SD) age of caregivers was 48.59 (12.44) years (range, 19–75 years). In addition, 78.3% (n = 129) of caregivers were married, 37.1% (n = 61) had primary or secondary school education, and 42.8% (n = 71) were employed. Seventy-nine (47.8%) reported that their income was equivalent to expenditure. Ninety-four caregivers (57.2%) were the spouse of a patient with stoma, and 63.8% (n = 105) of these caregivers were living with their patient. Caregivers had been providing care for their patients for a mean (SD) of 15.50 (20.88) months.

Exploratory factor analysis was conducted to evaluate the structure of each scale (ie, T-OSCI, T-CC-OSCI) by means of PAF with promax rotation and Kaiser normalization. The KMO coefficient and Bartlett test of sphericity chi-square value, respectively, for the T-OSCI were as follows: self-care maintenance (0.911, 1392.323), self-care monitoring (0.781, 715.954), self-care management (0.706, 217.841), and self-care confidence (0.911, 2210.897) (**Table 1**). The KMO coefficient and Bartlett test of sphericity chi-square value, respectively, for the T-CC-OSCI were as follows: caregiver contribution to self-care maintenance (0.718, 244.245), caregiver contribution to self-care monitoring (0.828, 574.539), and caregiver contribution to self-care management (0.620, 151.276) (**Table 2**). These results show that the data were clearly suitable for factor analysis.

Table 1. Factor Loadings in Exploratory Principal Axis Factoring With Promax Rotation for the Turkish Version of the Ostomy Self-Care Index

Items[a]	Factor 1	Factor 2	Factor 3
Self-care maintenance			
T-OSCI.1. Check that the stoma appliance and the collecting bags are appropriate to your needs.		0.817	
T-OSCI.2. Check that the stoma appliance and the collecting bags are in good conditions before use.		0.767	
T-OSCI.3. During substitution, remove the stoma appliance and the collecting bags from up to down.	0.763		
T-OSCI.4. Clean the skin around the stoma and stoma with water.	0.819		
T-OSCI.5. Perform dry dabbing of the skin around the stoma.	0.896		
T-OSCI.6. Adjust the size of the stoma in a new stoma appliance.	0.887		
T-OSCI.7. Fit a new stoma appliance from down to up by joining the lower edge of the stoma appliance to the lower edge of the stoma.	0.877		
T-OSCI.8. Change the stoma appliance according to information received.	0.919		
T-OSCI.9. Eating and drinking according to information received.	0.346		
KMO value: 0.911 ($P < .001$) Bartlett sphericity test: 1392.323			
Explained variance (%) (Total: 65.743)	59.375	6.368	
Self-care monitoring			
T-OSCI.10. Monitor for leaks (feces or urine) from the stoma appliance.	0.501		
T-OSCI.11. Monitor the condition of filling of the collecting bag.	0.507		
T-OSCI.12. Monitor the stoma state.	0.800		
T-OSCI.13. Monitor the skin around the stoma.	0.830		
T-OSCI.14. Monitor the amount of and the changes in feces and urine.	0.637		
T-OSCI.15. Monitor the effects of eating and drinking on the feces and urine (feces too liquid/solid, concentrated urine).	0.692		
T-OSCI.16. Monitor your weight.	0.636		

during the last month, how quickly did you recognize it as a stoma problem?			
T-OSCI.19. Change your diet or fluid intake to decrease or to stop the problem.		0.639	
T-OSCI.20. Change the way you manage the stoma and the skin around the stoma.		0.684	
T-OSCI.21. Call your stoma therapist / nurse / doctor for guidance.	0.912		
T-OSCI.22. Talk about the problem with your stoma therapist / nurse / doctor during the next visit.	0.850		
KMO value: 0.706 ($P < .001$) Bartlett sphericity test: 217.841			
Explained variance (%) (Total: 55.41)	45.206	9.099	1.105
Self-care confidence			
T-OSCI.23. Maintain the stoma and the skin around the stoma in good conditions without problem?	0.799		
T-OSCI.24. Follow the treatment advice you have been given for stoma management	0.881		
T-OSCI.25. Persist to follow the treatment advice you have been given for stoma management even if it is hard	0.822		
T-OSCI.26. Monitoring the stoma and the skin around the stoma condition	0.850		
T-OSCI.27. Persist to monitor the stoma and the skin around the stoma condition	0.896		
T-OSCI.28. When they happen, recognize changes in your stoma and the skin around the stoma?	0.848		
T-OSCI.29. Evaluate the importance of stoma and the skin around the stoma problems	0.862		

T-OSCI.30. Do something that will relieve your stoma and the skin around the stoma problems	0.843		
T-OSCI.31. Persist to find a remedy for a stoma and the skin around the stoma problems even if it is difficult/hard	0.797		
T-OSCI.32. Evaluate how well a remedy works for stoma and the skin around the stoma problems	0.851		
KMO value: 0.911 ($P < .001$) Bartlett sphericity test: 2210.897			
Explained variance (%) (Total: 71.488)	71.488		

Abbreviations: KMO, Kaiser-Meyer-Olkin; T-OSCI, Turkish version of the Ostomy Self-Care Index.

Table 2. Factor Loadings in Exploratory Principal Axis Factoring With Promax Rotation for the Turkish Version of the Caregiver Contribution to Self-Care in Ostomy Patient Index

Items[a]	Factor 1	Factor 2	Factor 3
Caregiver contribution to self-care maintenance			
T-CC-OSCI.1. Check that the stoma appliance and the collecting bags are appropriate to your needs.		0.506	
T-CC-OSCI.2. Check that the stoma appliance and the collecting bags are in good condition before use.		0.654	
T-CC-OSCI.3. During substitution, remove the stoma appliance and the collecting bags from up to down.	0.470		
T-CC-OSCI.4. Clean the skin around the stoma and stoma with water.	0.376		
T-CC-OSCI.5. Perform dry dabbing of the skin around the stoma.	0.464		
T-CC-OSCI.6. Adjust the size of the stoma in a new stoma appliance.	0.400		
T-CC-OSCI.7. Fit a new stoma appliance from down to up by joining the lower edge of the stoma appliance to the lower edge of the stoma.	0.565		
T-CC-OSCI.8. Change the stoma appliance according to information received.	0.777		
T-CC-OSCI.9. Eating and drinking according to information received.	0.439		
KMO value: 0.718 ($P < .001$) Bartlett sphericity test: 244.245			
Explained variance (%) (Total: 31.924)	23.720	8.204	
Caregiver contribution to self-care monitoring			
T-CC-OSCI.10. Monitor for leaks (feces or urine) from the stoma appliance.	0.685		
T-CC-OSCI.11. Monitor the condition of filling of the collecting bag.	0.636		
T-CC-OSCI.12. Monitor the stoma state.	0.690		
T-CC-OSCI.13. Monitor the skin around the stoma.	0.562		
T-CC-OSCI.14. Monitor the amount of and the changes in feces and urine.	0.767		
T-CC-OSCI.15. Monitor the effects of eating and drinking on the feces and urine (feces too liquid/solid, concentrated urine).	0.745		
T-CC-OSCI.16. Monitor your weight	0.713		
around the stoma during the last month, how quickly did you recognize it as a stoma problem?			
T-CC-OSCI.19. Change your diet or fluid intake to decrease or to stop the problem.		0.743	
T-CC-OSCI.20. Change the way you manage the stoma and the skin around the stoma.		0.711	
T-CC-OSCI.21. Call your stoma therapist / nurse / doctor for guidance.	0.884		
T-CC-OSCI.22. Talk about the problem with your stoma therapist / nurse / doctor during the next visit.	0.903		
KMO value: 0.620 ($P < .001$) Bartlett sphericity test: 151.276			
Explained variance (%) (Total: 54.121)	40.792	12.655	0.674

Abbreviations: KMO, Kaiser-Meyer-Olkin; T-CC-OSCI, Turkish version of the Caregiver Contribution to Self-Care in Ostomy Patient Index.
[a]KMO.

Within the EFA, 1 factor was identified for self-care monitoring (factor loadings ranged from 0.501–0.830) and self-care confidence (factor loadings ranged from 0.797–0.896) scales of the T-OSCI. Two factors were identified for self-care maintenance (factor loadings ranged from 0.346–0.919), with 3 factors identified for self-care management (factor loadings ranged from 0.388–0.912). The T-CC-OSCI scales showed similar outcomes: 1 factor was identified for caregiver contribution to self-care monitoring (factor loadings ranged from 0.474–0.767). Two factors were identified for caregiver contribution to self-care maintenance (factor loadings ranged from 0.376–0.777), and 3 factors were identified for caregiver

contribution to self-care management (factor loadings ranged from 0.184–0.903). The explained variance values by scales and subscales for T-OSCI are shown in **Table 1** and for T-CC-OSCI are shown in **Table 2**. **Table 3** presents the scores of the scales of both instruments.

Table 3. Scores of Both Scales

Scale	Mean (SD)	Min-Max	Range
T-OSCI maintenance	65.99 (31.58)	0-100	0-100
T-OSCI monitoring	77.78 (22.07)	0-100	0-100
T-OSCI management	59.88 (25.23)	0-100	0-100
T-OSCI confidence	68.19 (29.33)	0-100	0-100
T-CC-OSCI maintenance	89.95 (11.52)	38.89-100	0-100
T-CC-OSCI monitoring	80.71 (20.99)	3.13-100	0-100
T-CC-OSCI management	70.72 (19.70)	20-100	0-100

Abbreviations: Max, maximum; Min, minimum; T-CC-OSCI, Turkish version of the Caregiver Contribution to Self-Care in Ostomy Patient Index; T-OSCI, Turkish version of the Ostomy Self-Care Index; SD, standard deviation.

The Cronbach α coefficients for T-OSCI were as follows: self-care maintenance, 0.923; self-care monitoring, 0.843; self-care management, 0.767; and self-care confidence, 0.961 (**Table 4**). The T-CC-OSCI also exhibited internal consistency. The Cronbach α coefficients were 0.691, 0.859, and 0.684, respectively, for the caregiver contribution to self-care maintenance, caregiver contribution to self-care monitoring, and caregiver contribution to self-care management scales. Internal consistency was also high for the overall index in both instruments (T-OSCI = 0.968, T-CC-OSCI = 0.862).

Table 4. Reliability Analysis of Both Scales

Scale	Cronbach α coefficient	Hotelling T^2 test (*P* value)	Floor or ceiling effects (%)
T-OSCI maintenance	0.923	77.122 (<.001)	18.31
T-OSCI monitoring	0.843	187.191 (<.001)	19.30
T-OSCI management	0.767	30.894 (<.001)	10.44

Index; T-OSCI, Turkish version of the Ostomy Self-Care Index.

The Hotelling T^2 test values indicated that there was no response bias (**Table 4**). No floor or ceiling effects were determined for the T-OSCI or the T-CC-OSCI.

The T-OSCI and the T-CC-OSCI were also found to be reliable with respect to test-retest reliability, based on ICC. The ICC was 0.998 (95% CI, 0.996-0.999) for self-care maintenance, 0.965 (95% CI, 0.919-0.985) for self-care monitoring, 0.973 (95% CI, 0.932-0.989) for self-care management, and 0.990 (95% CI, 0.978-0.996) for self-care confidence. The ICC was 0.897 (95% CI, 0.775-0.953) for caregiver contribution to self-care maintenance, 0.960 (95% CI, 0.912-0.982) for caregiver contribution to self-care monitoring, and 0.909 (95% CI, 0.764-0.965) for caregiver contribution to self-care management. No significant difference was found between the mean (SD) test and retest scores for either the T-OSCI (n = 24 patients) or the T-CC-OSCI (n = 27 caregivers) (*P* > .05) (**Table 5**).

Table 5. Test-Retest Scores of Both Scales

Scale	Test (mean [SD])	Retest (mean [SD])	Wilcoxon z value (*P* value)
T-OSCI maintenance	88.55 (17.13)	89.13 (17.04)	−1.890 (.059)
T-OSCI monitoring	92.19 (9.49)	93.62 (9.19)	−1.876 (.061)
T-OSCI management	78.33 (13.07)	80.24 (13.37)	−1.930 (.054)
T-OSCI confidence	86.25 (18.18)	86.46 (18.62)	−.686 (.493)
T-CC-OSCI maintenance	92.91 (7.07)	94.14 (6.59)	−1.429 (.153)
T-CC-OSCI monitoring	89.00 (12.89)	90.51 (12.96)	−1.841 (.066)
T-CC-OSCI management	77.63 (10.97)	79.74 (12.96)	−1.186 (.236)

Abbreviations: T-CC-OSCI, Turkish version of the Caregiver Contribution to Self-Care in Ostomy Patient Index; T-OSCI, Turkish version of the Ostomy Self-Care Index; SD, standard deviation.

Discussion

In the current study, the T-OSCI and the T-CC-OSCI were translated from English to Turkish and tested for psychometric properties in Turkish adult patients with an ostomy and their caregivers. The authors of the current study showed that the T-OSCI and the T-CC-OSCI provide reliable and valid scores for these patients and caregivers.

To the knowledge of the authors of the current study, the OSCI and the CC-OSCI have not been translated into any other language, nor have their psychometric properties been evaluated. In this study, face validity was tested on persons with characteristics similar to those of the target groups before applying the indexes. However, no comparison could be made because face validity was not performed in the original version of the indexes.[5] Participants reported that the scale items for the T-OSCI and the T-CC-OSCI were intelligible, they answered the items easily, and the number of questions was sufficient. The CVI scores were within the acceptable ranges in the current study.[21] In addition, a high rate of expert agreement (95% for OSCI, 93% for CC-OSCI) was indicated by content validity tests in the original study.[5] This demonstrates that experts reached an acceptable level of agreement that the T-OSCI and the T-CC-OSCI were capable of measuring the intended concept.

Exploratory factor analysis was performed to examine the dimensionality of the T-OSCI and the T-CC-OSCI. Similar to the original study, the analysis was performed separately for the 4 T-OSCI scales and the 3 T-CC-OSCI scales. In the current

2) and stoma care behavior (items 3–9). The caregiver contribution to self-care management scale showed 3-factor features, as in the original study, and was named similarly: autonomous self-care management behaviors (items 19 and 20) and consultative self-care management behaviors (items 21 and 22). Item 18 was found to have a low factor loading and was irrelevant. With the exception of item 18, the factor loadings were all within acceptable ranges reported in the literature.[29,30] The structure in the present study was the same as in the initial study,[5] showing that the items had a solid connection to each factor and that factors accurately measured the construct they were designed to assess in a solid factor structure. These findings indicate that the scales can produce valid results.

The T-OSCI and the T-CC-OSCI were found to produce reliable results. The Cronbach α coefficients in the initial study ranged from 0.930 to 0.965 for the OSCI and from 0.912 to 0.972 for the CC-OSCI.[5] For measurement tools, a Cronbach α of 0.70 or greater is appropriate.[31,32] In this study, the Cronbach α coefficients for the T-OSCI and the T-CC-OSCI were also within these limits. In addition, the Hotelling T^2 test found no significant response bias, showing that responses to the questions were based on individuals' own ideas and not external factors.[25,33] The floor and ceiling effect was below 20%, showing the absence of this bias.[25,33] There was no significant difference in mean test or retest scores for either the T-OSCI or the T-CC-OSCI, which indicates that measurements were stable over time. The ICC values ranged from 0 to 1, with a value close to 0 indicating low reliability and a value close to 1 indicating excellent reliability.[34] In the current study, the ICC values were close to 1, demonstrating good reliability of the scales.

Limitations

The current study had several limitations. The data were collected from volunteer adult patients with an ostomy and their caregivers in a university hospital in western Turkey. The use of nonrandom sampling limits generalizability because of possible bias. This should be considered in future research. Furthermore, confirmatory factor analysis was not performed

because the sample was not large enough to divide the data set into 2 groups. In future studies, the construct validity of the scales should be tested using confirmatory factor analysis.

Conclusion

The T-OSCI and the T-CC-OSCI are valid and reliable indexes to measure the self-care of patients with an ostomy and their caregivers. These self-administered instruments are simple to deliver and score in research and clinical settings. These indexes will allow health professionals to evaluate self-care in research and clinical settings, identify educational needs, and evaluate appropriate self-care initiatives for patients with an ostomy and their caregivers. Future studies should additionally investigate a dyadic assessment of the psychosocial patient-caregiver interactions and viewpoints to account for dependency in the dyadic data, given that the CC-OSCI is identical to the OSCI in terms of its content.

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