



Adaptation of the Colostomy Impact Score for Use in the Turkish Population: A Validity and Reliability Study

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ABSTRACT

Aim: This study was conducted to adapt the colostomy impact (CI) score for use in the Turkish population and evaluate its validity and reliability.

Method: For data collection, the Descriptive Characteristics Form, CI score, and Stoma Quality-of-Life Scale were used. The CI score, designed to assess stoma dysfunction impacting health-related quality of life in patients with a colostomy, comprises one dimension and seven question items. Data were collected from individuals with colostomies who met the inclusion criteria between January 2022 and March 2023. The test-retest procedure was administered to 20 participants in the sample group.

Results: The research involved 202 participants with colostomies. The mean CI score was 15.40±8.13. All CI score items significantly contributed to the total score. The test-retest assessments exhibited statistically significant similarity ($p=0.119$). The intraclass correlation coefficient was 0.45, which is statistically significant ($p=0.001$). Confirmatory factor analysis indicated acceptable moderate fit within the limits. The mean score derived from the CI score demonstrated a statistically significant negative relationship with the Stoma Quality-of-Life Scale ($r=-0.711$, $p=0.001$).

Conclusion: Methodologically conducted, this study determined that the CI score is a valid and reliable measurement tool for use in the Turkish population. It is recommended that the CI score be utilized in various studies and with larger sample groups in future research.

Keywords: Colostomy, quality of life, stoma dysfunction, colostomy impact score

Introduction

A colostomy may be required temporarily or permanently for the management of various pathological conditions, such as congenital anomalies, colonic obstruction, inflammatory bowel disease, intestinal trauma, or gastrointestinal malignancy.^{1,2} Although colostomy is considered a therapeutic approach, it results in the loss of voluntary bowel control and the transition from previously discreet bowel elimination functions to a more visible state. Colostomy, which alters voiding habits and causes functional loss or changes, exposes individuals to diverse life experiences in physiological, psychological, social, and other

aspects. These experiences significantly impact the adaptation process to colostomy and overall quality of life.^{1,3,4}

In the literature, studies show that the lives of individuals with ostomy/colostomy are affected at different levels. In the study by Krogsgaard et al.⁵ ($n=2,262$), 19% of patients reported “a lot of” or “some” restrictions on daily activities because of the stoma, with 44% reporting no restrictions. The study conducted by Baykara et al.⁶ ($n=30$) reported that ostomy negatively impacted the biopsychosocial quality of life of both individuals and their spouses. In a study by Colbran et al.³ with a sample size of 23, 65.2% of patients with permanent colostomy believed their colostomy caused some degree of restriction in their



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daily activities or chores. In research studies, although ostomy generally has a negative impact on individuals' lives, patients who receive sufficient information and counseling about the process tend to exhibit improved quality of life and adaptation to ostomy.⁵⁻⁷

The methods and measurement tools used to evaluate the objective and subjective effects of ostomy are gaining value daily. Evaluating health-related quality of life in individuals with colostomy, one type of ostomy, is an essential source of data on the individual's life, health, disease, diagnosis, and treatment processes.⁸ Valid and reliable measurement tools facilitate the presentation of quantitative data and consider individual differences. Several measurement instruments have been developed to examine the impact of stoma on quality of life.^{9,10} One of these measurement tools is the colostomy impact (CI) score. The CI score, developed by Thyø et al.¹¹, has one dimension consisting of seven question items.⁴ The CI score is a tool related to stoma dysfunction that influences health-related quality of life. It assists healthcare professionals in identifying patients with stoma dysfunction effectively and systematically, enabling targeted interventions.⁸

The CI score was developed based on a study involving individuals who underwent permanent colostomy as a result of rectal cancer (n=610). It has been established as a valid measurement tool within the Danish community.¹¹ In a study conducted by Kristensen et al.⁴ (n=244), it was determined that the CI score is a valid measurement tool that can also be used in individuals who undergo colostomy following surgery for other benign conditions such as ileus and Crohn's disease in addition to rectal cancer. In the study by Kristensen et al.⁸, the CI score was administered to 2,470 patients across communities in Australia, China, Denmark, Portugal, the Netherlands, Spain, and Sweden. The structure of the CI score, along with its discriminative validity, sensitivity, and specificity, was evaluated, confirming its validity and reliability.⁸

The CI score's unidimensional nature, consisting of seven items, and ability to provide quick responses are essential factors supporting its use. It is crucial to adapt the CI score, which has been adapted for many societies, into a format usable within the Turkish community. The results from this research are expected to offer a quantitative understanding of the current situation among individuals with colostomies, enabling the planning of preventive and therapeutic interventions. Furthermore, these findings are believed to guide the conduct of new studies contributing to the field.

Aim

The research was conducted to adapt the CI score for use in the Turkish population and evaluate its validity and reliability.

Materials and Methods

Design and Setting

This study had a methodological design. The research was conducted with 202 individuals with colostomies who visited the stomatherapy units of hospitals that granted institutional permission. Data were collected between January 2022 and March 2023.

Procedures

To adapt the CI score for use in the Turkish population and conduct validity and reliability studies, permission was obtained through e-mail from the authors who developed the CI score. The adaptation process followed the recommendations of the International Test Commission¹² and the World Health Organization.¹³ The steps followed in the adaptation process are outlined below.

1. Translation: The CI score was translated from English to Turkish by three native Turkish speakers with a strong command of both languages.

2. Semantic explanations: The researchers meticulously analyzed the Turkish translations provided by the three experts. A single draft form that best represented the items was then created.

3. Expert committee assessment: The draft of the CI score translated into Turkish was sent to seven experts who are knowledgeable about stoma-related concepts and have experience in this field. The experts independently evaluated whether the words had equivalent meanings in both languages, whether the sentences were ambiguous, whether the items had culturally altered meanings, and whether they were appropriate for the target group. Feedback was obtained from a Turkish language expert to assess the appropriateness of the items for Turkish culture and grammar. The content validity indices of the items were calculated using the Davis technique, where each item was rated from "a" to "d" (a: appropriate, b: needs some revision, c: needs major revision, d: inappropriate). The proportion of experts selecting "a" and "b" was then divided by the total number of experts, resulting in a content validity index for each item.¹⁴ Items achieving a content validity index value of 0.80 and above were included in the Turkish draft version. The content validity index and the content validity ratio were both calculated as 1 (100%).

4. Back translation: The CI score was back translated into English by a language expert proficient in advanced English and not involved in the initial translation. The English back translation was synthesized by the researchers and compared with the original version.

5. Pilot application: A preliminary study involving 30 participants was conducted to assess the comprehensibility of

the items. Participants were instructed to read the items and briefly explain their understanding of each item's meaning. Following the pilot application, no changes were necessary for the Turkish draft form.

6. Final version: The back translation into English was sent to the author who developed the original CI score via e-mail. Based on the positive feedback received from the author, the final Turkish version of the CI score was obtained.

7. Documentation: The adaptation stages were meticulously documented, with careful attention paid to each phase of the adaptation process.¹⁵

Participants

The inclusion criteria for the research were individuals aged 18 years or older who had a permanent colostomy or had been living with a colostomy for at least 12 months, understood and spoke Turkish, and consented to participate in the study. Exclusion criteria for the research comprised individuals who had physical or mental health issues that would prevent them from completing or understanding the data collection forms or who were unwilling to participate voluntarily. The criterion for withdrawal from the study was incomplete or inaccurate completion of the data collection forms.

In cross-cultural adaptation studies, Kline¹⁶ recommends a minimum sample size of 200, whereas Hair et al.¹⁷ indicate that each parameter of the measurement tool should be responded to by at least 10 participants, with a total dataset size of at least 100 or more.¹⁸ Based on the inclusion, exclusion, and withdrawal criteria, a total of 206 individuals were initially included in this study. However, four individuals who completed the form incompletely were excluded from the sample group. Accordingly, the final sample group consisted of 202 individuals with colostomies. The sample size for this research meets the criteria mentioned above.

Data Collection Forms

The data collection utilized the Descriptive Characteristics Form, the CI score, and the Stoma Quality-of-Life Scale.

The researchers developed the Descriptive Characteristics Form. The formulation of these questions drew upon both existing literature^{2,6,19} and the researchers' academic expertise. The CI score was developed by Thyø et al.¹¹ for individuals who underwent permanent colostomy as a result of rectal cancer. It determines health-related quality of life affected by stoma dysfunction with a sensitivity of 85.7% and specificity of 59.5%.¹¹ Subsequent studies have determined that the CI score can also be utilized in individuals with colostomies for reasons other than rectal cancer, including those with permanent colostomies or individuals who have had a colostomy for at least 12 months.^{4,8} The CI score is unidimensional and consists

of seven items. Each item has different response options: three response options for items 1, 2, and 6; five response options for item 3; and two response options for items 4, 5, and 7. Each response option corresponds to a different score. The CI score ranges from 0 to 38, reflecting the impact of colostomy on an individual's life. Higher scores indicate a major impact of colostomy, whereas lower scores indicate a minor impact. Scores of 0-9 indicate a minor CI score, whereas scores of 10-38 indicate a major CI score.

The Stoma Quality-of-Life Scale was developed by Baxter et al.¹⁰ and consists of two sections, twenty-one items, and four subscales. The first two items of the scale relate to overall satisfaction with life and are scored on a scale of 0 to 100. A score of 0 indicates complete dissatisfaction, whereas a score of 100 indicates complete satisfaction. The remaining nineteen scale items are grouped into three subscales and utilize a 5-point Likert scale (1: never, 2: rarely, 3: sometimes, 4: often, and 5: always). These subscales include work/social life (6 items), sexuality/body image (5 items), and stoma function (6 items). The Turkish scale, validated by Karadağ et al.¹⁹, consists of nineteen items. The overall reliability coefficient for the Turkish version of the scale is 0.87.

Data Collection

Researchers visited stomatherapy units to obtain written permission. Individuals who met the inclusion criteria were provided detailed explanations about the purpose and methods of the study. Participants were instructed to carefully read all questions and mark the option that best suited their response.

Twenty participants were asked to complete the instruments again after 2 weeks. The consistency between the test-retest score averages of the participants was evaluated.

Ethical Considerations

Written permission was obtained from the Ethics Committee of a Gazi University (approval number: E-77082166-604.01.02-224999, date: 01.12.2021). Written permissions were also obtained from two separate hospitals where the study would be conducted (institution 1/date and number: 29.12.2021, E.251154; institution 2/date and number: 13.01.2022, E.263831). Permissions were obtained from the researchers who developed the CI score and adapted the Stoma Quality-of-Life Scale for the Turkish population.

Statistical Analysis

In the statistical evaluation, SPSS for Windows (Chicago, IL, USA) was utilized. A paired t-test was employed to examine the difference between the total impact score in the test and retest assessments, while intraclass correlation (ICC) analysis was used to assess internal consistency. The influence of the

seven questionnaire items constituting the CI score on the total score and their relationship with the Stoma Quality-of-Life Scale were evaluated using Pearson correlation analysis. Confirmatory factor analysis (CFA) was conducted to assess the fit of the CI score's item questions to the sample. The chi-square test and independent samples t-test were used to group the CI score. Independent samples t-test and One-Way analysis of variance with the Bonferroni post-hoc test were applied to analyze the mean scores obtained from the CI score. A p-value of 0.050 was considered to represent statistical significance.

Results

Descriptive Characteristics

Table 1 summarizes the descriptive characteristics of the participants (n=202). The mean age of the participants was 58.86±11.99 years, 51.5% (n=104) were male, 45.1% (n=91) were either illiterate or had only completed primary school, 82.7% (n=167) were married, and 48.5% (n=98) were retired. A total of 88.6% (n=179) of individuals lived with their families, 54% (n=109) had no comorbidities, and 80.7% (n=163) did not receive chemotherapy or radiotherapy. Moreover, 83.7% (n=169) had undergone planned stoma surgery, 85.1% (n=172) reported receiving information before surgery, and 53.5% (n=108) indicated that stoma marking was completed before surgery. In addition, 70.3% (n=142) had a permanent stoma, 83.2% (n=168) had undergone stoma creation as a result of cancer, 44.6% (n=90) performed stoma care themselves, and 65.8% (n=133) reported currently experiencing no complications related to their stoma. The average duration of living with a stoma was 4.30±4.62 years.

Table 2 presents the impact scores for minor, major, and total CI scores. Accordingly, 22.8% (n=46) of individuals had a minor impact score, and 77.2% (n=156) had a major impact score.

Table 3 presents the relationship between descriptive characteristics and mean CI score. It was found that individuals with a middle school education exhibited a statistically significantly lower mean CI score compared with others (p=0.026), and individuals with comorbidities had statistically significantly higher CI scores than those without (p=0.002). Patients with temporary stoma exhibited a statistically significantly higher CI score than patients with permanent stoma (p=0.003), and those reporting stoma-related complications had a statistically significantly higher CI score than those reporting no complications (p=0.001). Although not presented in the table, there is no statistically significant relationship between age and CI score (p=0.144).

Table 4 displays the distribution of responses across the seven items comprising the CI score. In total, 38.6% (n=78)

Table 1. Participant characteristics

Characteristics	n	%
Age (years) (mean ± SD)	58.86±11.99	
Gender		
Male	104	51.5
Female	98	48.5
Education status		
Illiterate, primary school graduate	91	45.1
Middle school	37	18.3
High school	41	20.3
University	33	16.3
Marital status		
Married	167	82.7
Single	35	17.3
Profession		
Not working	79	39.1
Retired	98	48.5
Working	25	12.4
Living with the person		
Alone	23	11.4
With his/her family	179	88.6
Comorbidities		
Yes	93	46.0
No	109	54.0
Chemotherapy, radiotherapy		
Yes	39	19.3
No	163	80.7
Operation setting		
Emergency	33	16.3
Planned	169	83.7
Receiving information before surgery		
Informed	172	85.1
Not informed	30	14.9
Stoma marking before surgery		
Done	108	53.5
Not done	94	46.5
Stoma		
Temporary	60	29.7
Permanent	142	70.3
Indication for surgery		
Cancer	168	83.2
Other	34	16.8
Need assistance for stoma care		
Self-care	90	44.6
Other	56	27.7
Assistance when needed	56	27.7
Stoma complications		
Yes	69	34.2
No	133	65.8
Time since stoma creation (years) (mean ± SD)	4.30±4.62	

SD: Standard deviation

of participants experienced embarrassing smells from their stoma bag less than once a week, 43.6% (n=88) did not experience stool leakage under the adapter, 38.1% (n=77) had variable feces consistency, 53% (n=107) did not experience pain around the stoma and its surroundings, 51% (n=103) did not encounter any skin problems around the stoma, 69.3% (n=140) had not noticed a bulge around the stoma, and 50.5% (n=102) managed stoma care themselves.

Evaluation of Reliability and Validity of the Colostomy Impact Score

In Table 5, the item-total correlations for the CI scores are presented. Accordingly, all seven question items have significantly affected the total CI score (p=0.001).

When analyzing the difference in CI scores between the test and retest measurements, no statistically significant difference was found between the mean scores (test: 12.90±7.21, retest: 12.45±6.97; p=0.119). The ICC calculated to assess the internal consistency of the CI score was found to be 0.45, which is statistically significant (p=0.001). This analysis determined that the items within the CI score are moderately consistent with each other.

To test the suitability of the one-dimensional CI score, CFA was applied. The fit indices such as the chi-square (χ^2) degrees of freedom (df), root mean square error of approximation (RMSEA), comparative fit index (CFI), and normed fit index (NFI) were used. The fit indices were $\chi^2/df=3.54$, RMSEA=0.11, CFI=0.83, and NFI=0.78 (Figure 1).

The relationship between the scores obtained from the Stoma Quality-of-Life Scale and the CI score is provided in Table 6. Accordingly, the mean score obtained from the CI score exhibited a significantly negative relationship with the work/social life subdimension (r=-0.575, p=0.008), the sexuality/body image subdimension (r=-0.484, p=0.026), and the overall Stoma Quality-of-Life Scale (r=-0.711, p=0.001). Graphic 1 illustrates the relationship between the CI score and the overall Stoma Quality-of-Life Scale and its subdimensions.

Table 2. Participants' minor, major, and total colostomy impact scores

CI score	n	%
Minor CI score	46	22.8
Major CI score	156	77.2
CI score ($\bar{X} \pm SD$)	15.40±8.13 (min.: 0, max.: 36)	

CI: Colostomy impact, \bar{X} : Mean, SD: Standard deviation, min.: Minimum, max.: Maximum

Table 3. Relationship between descriptive characteristics and mean colostomy impact scores

Characteristics	CI score, ($\bar{X} \pm SD$)	p
Gender		
Male	14.70±8.18	0.206
Female	16.15±8.06	
Education status		
Illiterate, primary school graduate	16.80±8.07	0.026
Middle school	12.03±6.97	
High school	15.68±9.17	
University	15.00±7.33	
Marital status		
Married	15.70±8.26	0.322
Single	15.67±7.09	
Profession		
Not working	16.75±8.34	0.140
Retired	14.31±7.91	
Working	15.48±8.04	
Living with the person		
Alone	14.52±8.26	0.558
With his/her family	15.52±8.14	
Comorbidities		
Yes	17.27±8.18	0.002
No	13.82±7.78	
Chemotherapy, radiotherapy		
Yes	16.87±8.46	0.211
No	15.06±8.04	
Operation setting		
Emergency	16.09±8.69	0.598
Planned	15.27±8.04	
Receiving information before surgery		
Informed	15.68±8.20	0.252
Not informed	13.83±7.67	
Stoma marking before surgery		
Done	15.44±8.05	0.943
Not done	15.36±8.27	
Stoma		
Temporary	17.98±8.12	0.003
Permanent	14.32±7.92	
Indication for surgery		
Cancer	15.72±8.20	0.223
Other	13.85±7.75	
Need assistance for stoma care		
Self-care	11.30±6.22	0.001
Other	20.48±7.19	
Assistance when needed	16.93±8.44	
Stoma complications		
Yes	21.03±7.40	0.001
No	12.49±6.89	

CI: Colostomy impact, \bar{X} : Mean, SD: Standard deviation

Table 4. Participants' responses to the colostomy impact score items

CI score items	n	%
Do you experience embarrassing smells from your stoma bag?		
No, never	77	38.1
Yes, less than once a week	78	38.6
Yes, at least once a week	47	23.3
Do you experience seepage of feces under the sticking plaster?		
No, never	88	43.6
Yes, less than once a week	81	40.1
Yes, at least once a week	33	16.3
What is the consistency of your feces?		
Hard and lumpy	22	10.9
Formed and soft	51	25.2
Mushy	32	15.8
Watery	20	9.9
Variable	77	38.1
Do you ever experience pain in and around the stoma?		
No, never	107	53.0
Yes	95	47.0
Do you experience any skin problems around your stoma?		
No, never	103	51.0
Yes	99	49.0
Have you noticed a bulge around the stoma?		
No	140	69.3
Yes, I have a small bulge (under 10 cm)	47	23.3
Yes, I have a large bulge (over 10 cm)	15	7.4
Who manages your stoma care?		
I do it all myself	102	50.5
I need support and instruction	100	49.5

CI: Colostomy impact

Table 5. Item-total correlations of colostomy impact scores

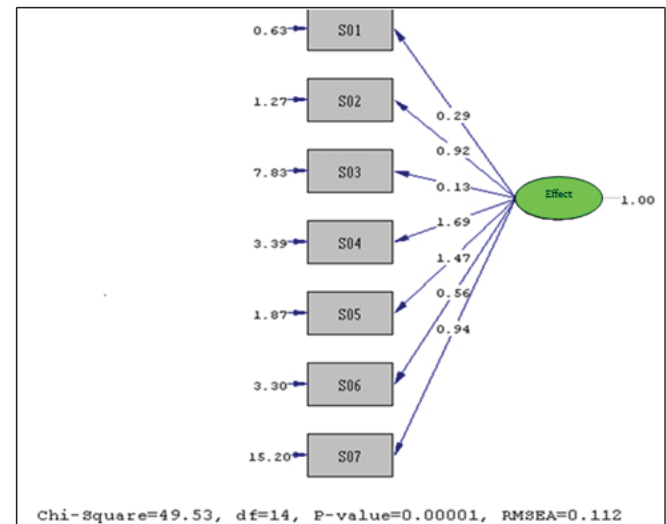
CI score items	Total point	
	r	p
Item 1	0.420	0.001
Item 2	0.551	0.001
Item 3	0.319	0.001
Item 4	0.650	0.001
Item 5	0.676	0.001
Item 6	0.426	0.001
Item 7	0.573	0.001

r: Pearson correlation coefficient, CI: colostomy impact

Table 6. Relationship between colostomy impact score and Stoma Quality-of-Life Scale

Stoma Quality-of-Life Scale and its subdimensions	CI score	p
Work/social life (6 items)	-0.575	0.008
Sexuality/body image (5 items)	-0.484	0.026
Stoma function (6 items)	-0.299	0.188
Total	-0.711	0.001

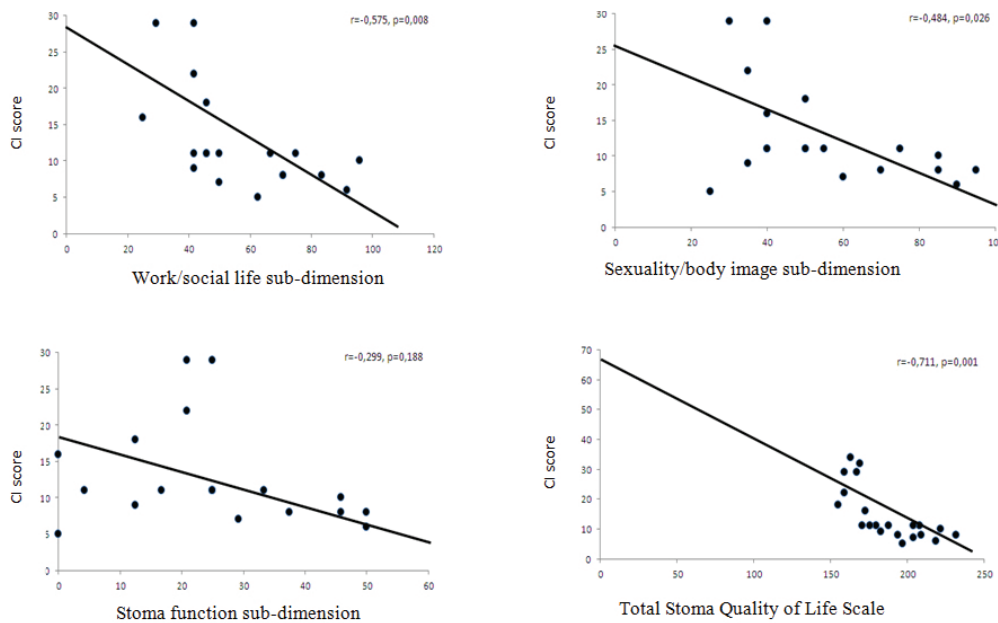
r: Pearson correlation coefficient, CI: colostomy impact

**Figure 1.** Confirmatory factor analysis for the colostomy impact score

Discussion

This study was conducted to adapt the CI score for use in the Turkish population and evaluate its validity and reliability (n=202). In this study, the mean CI score was 15.40 ± 8.13 , with 77.2% identified as having a major CI score (Table 2). Similar findings have been reported previously. In a study conducted by Kristensen et al.²⁰, 51.9% (n=1244) of individuals with colostomy had a minor CI score, whereas 48.1% (n=1154) had a major CI score. In a study conducted by Colbran et al.³, the mean CI score was 13.4 ± 2.5 , and 91.4% of patients (n=21) had a CI score greater than 10.

In our study, participants with different chronic diseases, those who underwent temporary stoma placement, and those reporting any stoma-related complications had statistically significantly higher CI scores (Table 3). In a study conducted by Kristensen et al.²⁰, stoma dysfunction measured by the CI score was significantly associated with unemployment, financial burden of the stoma, young age, being unmarried, and decreased health-related quality of life. In our research, the results indicated that participants experienced skin



Graphic 1. Relationship between the Stoma Quality-of-Life Scale and colostomy impact score
RMSEA: Root mean square error of approximation, CI: colostomy impact

problems around the stoma (49%, n=99), pain (47%, n=95), and expressed a need for support and information on stoma care (49.5%, n=100) (Table 4). In other studies, similarly determined by CI scores, the number of participants with skin problems ranged from 27% to 44.5%, stoma site pain from 17.4% to 31%, and the need for support and information in stoma care from 15% to 46.8%.^{4,5,21} Our study and other research findings reveal that individuals' adaptation to colostomy and their specific challenges vary.

The test-retest evaluation determined that individuals' mean CI score ratings were similar ($p=0.119$). The proximity of the mean ratings indicates a similarity between the two measurements. In a study by Kristensen et al.⁸, no differences were found in the item-level score or sum score between the test and the retest of the CI score. However, the scoring of CI score items differed and was not a continuous measurement. In our study, an ICC value of 0.45 was determined to be statistically significant ($p=0.001$), indicating that the CI score item questions were moderately consistent. In the study by Kristensen et al.⁸, ICC scores indicated moderate reliability in Sweden and the Netherlands for both the sum score (0.663 and 0.701, respectively) and item-level scores (0.640 and 0.749, respectively).

The CFA examines the fit of the constructed model based on the proposed factor structure of the measurement instrument with the data. The CFA fit indices for the CI score are presented in Figure 1. Accordingly, $\chi^2/df=3.54$, and since the index ranges between 3 and 5, this result indicates a moderate fit.²² In this study, RMSEA=0.11, which is considered acceptable, as values ≤ 0.08 are acceptable.²² The CFI was determined as 0.83 and

NFI as 0.78; CFI and NFI indices approaching 1 indicate excellent fit, whereas those approaching 0 indicate model misfit.^{22,23} The findings obtained from the analysis indicate that the factor structure of the CI score generally aligns with acceptable moderate fit within the limits.

In this study, individuals' CI scores were correlated with the Stoma Quality-of-Life Scale. The scale's work/social life and sexuality/body image subdimensions and the total score demonstrated significant negative correlations with the CI score (Table 6). In a study conducted by Khomyakov et al.²⁴, the Stoma Impact on Quality-of-Life Questionnaire revealed an inverse negative relationship with the European Organization for Research and Treatment of Cancer (EORTC) Core Quality-of-Life Questionnaire (QLQ-C30) global quality-of-life scale, including physical, emotional, role, and social functioning ($p<0.05$). In another study, patients reporting that colostomy "never" or "slightly" affected their quality of life (n=1850, 74.2%) had significantly higher EORTC QLQ-C30 functional scale scores compared with patients reporting that colostomy "slightly" or "very much" affected their quality of life (n=642, 25.8%).²⁰ Thus, the CI score is useful in evaluating health-related quality of life, and negative experiences related to stoma negatively affect quality of life.

Patients with colostomy face significant life changes.³ Adequate education on diagnosis, treatment procedures, colostomy care, and complication prevention is crucial to improve individuals' adjustment to the stoma and enhance their quality of life. Stoma care nurses and physicians bear significant responsibility during the preoperative and postoperative periods.⁶ In this regard, the CI score is considered a valuable

measurement tool for assessing current status and identifying areas for improvement.

Study Limitations

The researchers conducted the study in institutions where written consent was obtained; therefore, the study was limited to individuals in the stomatherapy units of two institutions. Another limitation was that the results of the measurement tools were evaluated based on self-reports provided by individuals with colostomy. Data were collected through participants' self-reports, potentially introducing a subjective aspect to the results. Furthermore, there could be information bias, as participants might over- or under-report their behaviors.

Conclusion

The results of this research indicate that the seven-item CI score is a valid and reliable measurement tool for individuals with colostomy in the Turkish population. Although describing and quantifying experiences is sometimes difficult, measurement tools provide reliable data. Therefore, the Turkish version of the CI score can be used to evaluate the impact of a stoma on patients who undergo a colostomy. It is recommended that research be conducted on stoma function and the quality of life of patients with a colostomy using the CI score. Precautions should be taken when interpreting the results, remedial interventions should be implemented, and the outcomes should be evaluated.

Ethics

Ethics Committee Approval: Written permission was obtained from the Ethics Committee of a Gazi University (approval number: E-77082166-604.01.02-224999, date: 01.12.2021).

Informed Consent: Informed consent was obtained.

Authorship Contributions

Surgical and Medical Practices: E.S., Z.G.B., H.K., A.Ö.H., S.L., Concept: E.S., Z.G.B., H.K., A.Ö.H., S.L., Design: E.S., Z.G.B., H.K., A.Ö.H., S.L., Data Collection or Processing: E.S., Z.G.B., H.K., Analysis or Interpretation: E.S., Z.G.B., Literature Search: E.S., Z.G.B., Writing: E.S., Z.G.B., H.K., A.Ö.H., S.L.

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References

- Duluklu B, Şenol Çelik S. Quality of Life of Persons with Colostomy: Problems and Nursing Interventions. *HUHEMFAD*. 2019;6:111-119 (Turkish).
- Türkmenoglu G, Karadağ A. Problems Experienced by Spouses of Turkish Patients With a Stoma: A Descriptive, Cross-Sectional Study. *Wound Manag Prev*. 2019;65:33-41.
- Colbran R, Gillespie C, Christensen P, Kristensen HØ, Warwick A. Quality of life and financial impacts of permanent colostomy for rectal cancer. *J Coloproctol* 2024;44:e47-e52.
- Kristensen HØ, Krogsgaard M, Christensen P, Thomsen T. Validation of the colostomy impact score in patients ostomized for a benign condition. *Colorectal Dis*. 2020;22:2270-2277.
- Krogsgaard M, Kristensen HØ, Furnée EJB, Verkuijl SJ, Rama NJ, Domingos H, Maciel J, Solis-Peña A, Espín-Basany E, Hidalgo-Pujol M, Biondo S, Sjövall A, Emmertsen KJ, Thyø A, Christensen P. Life with a stoma across five European countries-a cross-sectional study on long-term rectal cancer survivors. *Support Care Cancer*. 2022;30:8969-8979.
- Baykara ZG, Eyikara E, Hin AÖ, Acarlar H, Leventoglu S. Changes in the Lives of Individuals with a Stoma and Their Spouses: A Qualitative Study. *Adv Skin Wound Care*. *Adv Skin Wound Care*. 2022;35:281-288.
- Ongün P, Yılmaz NB, Kırıl Yİ. Anxiety, Sexuality and Quality of Life of Individuals with Stoma: A Systematic Review. *THDD*. 2021;2:41-52 (Turkish).
- Kristensen HØ, Thyø A, Jøssing Emmertsen K, Smart NJ, Pinkney T, Warwick AM, Pang D, Furnée EJB, Verkuijl SJ, José Rama N, Domingos H, Maciel J, Solis-Peña A, Espín Basany E, Hidalgo-Pujol M, Biondo S, Sjövall A, Christensen P. Translation and international validation of the Colostomy Impact score. *Colorectal Dis*. 2021;23:1866-1877.
- Prieto L, Thorsen H, Juul K. Development and validation of a quality of life questionnaire for patients with colostomy or ileostomy. *Health Qual Life Outcomes*. 2005;3:62.
- Baxter NN, Novotny PJ, Jacobson T, Maidl LJ, Sloan J, Young-Fadok TM. A stoma quality of life scale. *Dis Colon Rectum*. 2006;49:205-212.
- Thyø A, Emmertsen KJ, Pinkney T, Christensen P, Laurberg S. The colostomy impact score: development and validation of a patient reported outcome measure for rectal cancer patients with a permanent colostomy. A population-based study. *Colorectal Dis*. 2017;19:25-33.
- International Test Commission (ITN). Guidelines for translating and adapting tests. *International Journal of Testing*. 2018;18:101-134.
- World Health Organization (WHO). (2017). Process of translation and adaptation of instruments. Available from: http://www.who.int/substance_abuse/research_tools/translation/en/
- Davis LL. Instrument review: Getting the most from a panel of experts. *App Nurs Res*. 1992;5:194-197.
- Çapık C, Gözüm S, Aksayan S. Intercultural Scale Adaptation Stages, Language and Culture Adaptation: Updated Guideline. *Florence Nightingale J Nurs*. 2018;26:199-210 (Turkish).
- Kline RB. *An Easy Guide to Factor Analysis*. New York: The Guilford Press; 2011.
- Hair JF, Anderson RE, Babin BJ, Black WC. *Multivariate data analysis: A global perspective*. Upper Saddle River, NJ: Pearson; 2010; p. 7.
- Yücel E, Çizel B. Adaptation of the Cognitive Dissonance Scale into Turkish: The Validity and Reliability Study. *Journal of Travel and Hospitality Management*. 2019;16:106-120 (Turkish).
- Karadağ A, Öztürk D, Çelik B. Adaptation of Quality Life Scale for The Ostomy Patients into Turkish. *Journal of Disease of the Colon and Rectum*. 2011;21:173-181 (Turkish).
- Kristensen HØ, Thyø A, Emmertsen KJ, Smart NJ, Pinkney T, Warwick AM, Pang D, Elfeki H, Shalaby M, Emile SH, Abdelkhalek M, Zuhdy M, Poskus T, Dulskas A, Horesh N, Furnée EJB, Verkuijl SJ, Rama NJ, Domingos H, Maciel J, Solis-Peña A, Espín-Basany E, Hidalgo-Pujol M, Biondo S, Sjövall A, Christensen P. Surviving rectal cancer at the cost of a colostomy: global survey of long-term health-related quality of life in 10 countries. *BJS Open*. 2022;6:zrac085.
- Wang J, Zhong C, Kristensen HØ, Christensen P, Liu J, Pang D. Validation of the Chinese version of the colostomy impact score in rectal cancer patients with permanent colostomy. *Colorectal Dis*. 2022;24:773-781.

22. Çokluk Ö, Şekercioğlu G, Büyüköztürk Ş. Sosyal bilimler için çok değişkenli istatistik SPSS ve LISREL uygulamaları. Pegem akademi, 6. Baskı, Ankara; 2021; p. 268-272.
23. Schermelleh-Engel K, Moosbrugger H, Müller H. Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measures. MPR-online. 2003;8:23-74.
24. Khomyakov EA, Pikunov DY, Mamedli ZZ, Karachun AM, Kostenko NV, Zhilin IV, Ignatov IS, Medvednikov AA, Moskalev AI, Khakamov TS, Skopintsev VB, Lukmonov SN, Samsonov DV, Razuvailova AG, Lee YB, Radostev SI, Ayupov RT, Malgina NV, Achkasov SI, Rybakov EG. Validation and adaptation of the Russian version colostomy impact score (CIS). Koloproktologia. 2023;22:112-120.