The Reliability and Validity of Colorectal Cancer Fatalism Scale in Turkish Language: A Methodological Study

Kolorektal Kanser Kadercilik Ölçeği'nin Türkçe Geçerlik ve Güvenirliği: Metodolojik Bir Çalışma

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ABSTRACT

The aim of this study is to perform the Turkish validity and reliability study of the Colorectal Cancer Fatalism Scale. This methodological study was carried out between June 2016 and December 2017 in a province in the east of Turkey. A total of 200 healthy individuals aged 40 years and above constituted the population of the study. Demographic Information Form and Colorectal Cancer Fatalism Scale were used in the study. The scale consists of 15 questions with dichotomous answers. The data obtained from the sample were analyzed using exploratory-confirmatory factor analyses and internal validity coefficient. Local ethics committee approval was obtained for the study, and all stages were completed in accordance with the Declaration of Helsinki. The content validity index of the scale was found to be 0,96. The analysis of principal components revealed all item factor loads to be above 0,30 and the total variance explained to be 34,77%. In confirmatory factor analysis, the $x2/SD$ value was found 1,13, whereas the GFI, AGFI, CFI fix index value was 0,99, the RMSEA value was 0,056 and the SRMR value was 0,010. The KR-20 coefficient of the scale was found to be 0,80. The results show that the Colorectal Cancer Fatalism Scale has a single factor structure and is a valid and reliable measurement tool in Turkish Language. It is recommended that the validity-reliability study of the scale be repeated, especially in studies to be conducted in different regions.

Keywords: Colorectal cancer, Fatalism, Validity, Reliability

ÖZ

Bu çalışmanın amacı Kolorektal Kanser Kadercilik Ölçeği'nin Türkçe geçerlik ve güvenirlik çalışmasını yapmaktır. Metodolojik türde planlanan bu araştırma Haziran 2016-Aralık 2017 tarihleri arasında, Türkiye'nin doğusunda yer alan bir ilde gerçekleştirilmiştir. Çalışmanın örneklemini 40 yaş ve üzeri 200 sağlıklı birey oluşturmuştur. Araştırmada Demografik Tanıtım Formu ve Kolorektal Kanser Kadercilik Ölçeği kullanılmıştır. Ölçek, dichotom formatta cevaplanmakta ve 15 sorudan oluşmaktadır. Bu çalışmada örneklemden elde edilen veriler açıklayıcı-doğrulayıcı faktör analizleri ve iç geçerlilik kat sayısı ile analiz edilmiştir. Ölçeği geliştiren yazardan yazılı izin alınmış ve tüm aşamalarda Helsinki Deklerasyonu'na uygun davranılmıştır. Ölçeğin kapsam geçerlilik indeksi 0,96 olarak bulunmuştur. Temel bileşenler analizinde; tüm maddelerin faktör yüklerinin 0,30'un üzerinde olduğu ve açıklanan toplam varyansın %34,77 olduğu saptanmıştır. Doğrulayıcı faktör analizinde; $x2/SD$ değerinin 1,13, GFI, AGFI, CFI uyum indeksi değerlerinin 0,99, RMSEA değerinin 0,056 ve SRMR değerinin 0,010 olduğu belirlenmiştir. Ölçeğin KR-20 katsayısı 0,80 olarak bulunmuştur. Araştırma sonucunda Kolorektal Kanser Kadercilik Ölçeği'nin tek faktörlü yapıya sahip olduğu ve Türk Dili'nde geçerli ve güvenilir bir ölçüm aracı olduğu belirlenmiştir. Ölçeğin geçerlik-güvenirlik çalışmasının özellikle farklı bölgelerde yapılacak araştırmalarda tekrarlanması önerilmektedir.

Anahtar Kelimeler: Kolorektal kanser, Kadercilik, Geçerlilik, Güvenirlik

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INTRODUCTION

Colorectal cancer (CRC), also known as bowel, colon or rectal cancer, is a common disease with a high mortality rate. CRC, which accounts for approximately 10,2% of overall cancer incidence, is the third most common cancer worldwide.[1] In Turkey, parallel to the world, CRC is the third most common cancer with 27,4 per hundred thousand in men and 16,0 per hundred thousand in women.[2] CRC incidence varies 6-8 times according to regions. The highest incidence rates for CRC are in Europe, Australia/New Zealand, North America and East Asia. CRC exhibits a low incidence in most parts of Africa and South Asia.[1]

CRC, which is a universal public health problem, significantly affects the health and well-being of individuals. Individuals need to be healthy in order to meet their needs, adapt to the environment and change the environment.[3] Therefore, it is important to know the factors affecting individuals' health status. Although genetic characteristics are thought to be at the forefront, culture is an important factor affecting health status.

Culture encompasses quite a wide area from local beliefs, attitudes and habits to philosophical interpretations.[4] Responses of individuals from different groups to life-threatening diseases are largely based on their cultural backgrounds. Every culture has its own belief systems, perceptions, and thoughts about health and illness. Culture also determines the meaning individuals attach to cancer and their attitudes towards cancer. Fatalism, an outcome of the environment in which individuals live and the culture they are affected by, also plays an important role in the course of the disease.

Fatalism is a cultural feature and defined as the belief that the predetermined destiny will not change and that people have no choice abou.[5] Haraty et al. (2018) defined it as a belief in which a supernatural power, especially God, predetermines health outcomes.[6] The perception of fatalism is an important concept that shapes individuals' health status and attitudes. Available

international and domestic studies on fatalism showed that high fatalism tendency increases risk-taking behavior in adolescents,[7] decreases knowledge and precautions about the disease in AIDS patients,[7] increases risk-taking and reduce precautions in earthquakes or traffic accidents.[8-10] Another study found that individuals do not perform or they neglect some health behaviors due to their spiritual and religious beliefs.[11]

Various measurement tools are used in different studies on fatalism. For example, the "Powe Fatalism Inventory", developed by Powe, aims to measure fatalistic attitudes towards cancer with components such as fear, pre-symptoms, pessimism and helplessness.[12] Again, Shen, Condit and Wright (2009) try to measure the perception of fatalism with components of predetermination, luck and pessimism.[13]

Although some measurement tools that determine the effect of fatalism on health are available in the Turkish literature,[11, 14, 15] no scales have been found with regard to colorectal cancer fatalism. The colorectal cancer fatalism scale is a measurement tool that aims to determine whether the individual engages in preventive health behaviors. The scale aims to help remove cognitive barriers to health behaviors, health care and wellness practices. The scale also aims to measure fatalistic attitudes towards cancer with components such as fear, pre-symptoms, pessimism and helplessness.[16]

In conclusion, it is important to screen individuals rigorously with appropriate assessment tools and to identify colorectal cancer preventive behaviors and the factors that influence them. In this respect, it is necessary to develop effective interventions to identify the factors that determine colorectal cancer preventive behaviors. The present study was carried out with the aim to adapt the Colorectal Cancer Fatalism Scale, developed by Powe in 1995, into the Turkish society, by performing a Turkish validity and reliability study.

Research Hypothesis:

H₀: Colorectal Cancer Fatalism Scale is not a valid and reliable measurement tool in Turkish language.

H₁: Colorectal Cancer Fatalism Scale is a valid and reliable measurement tool in Turkish language.

MATERIAL AND METHOD

This methodological study was conducted between June 2016 and December 2017 on individuals living in the vicinity of a Family Health Center (FHC) in Kars, an eastern city in Turkey.

Participants

A total of 200 healthy individuals aged 40 years and above constituted the population of the study. Methodological studies request a target sample size at least 10 times higher than the number of items.[17, 18] With the scale consisting of 15 items, it was aimed to increase it 10 times, but a total of 200 participants were included in the study in order to better reveal the factor structure of the scale. Sample size is 13,3 times higher than the number of items. Characteristics of the participants are given in Table 1.

Steps of the study

The study was completed with the following steps: (1) translating the Colorectal Cancer Fatalism Scale into Turkish and re-translating it into English, (2) testing the content validity by an expert group, and (3) performing psychometric analyses (factor analysis, validity coefficient and item-total correlation).

Translation Process and Content Validity

Four academic nurses independently translated the Colorectal Cancer Fatalism Scale into Turkish, and then the scale was translated back into its original language. The back translation was performed by two independent academicians working as lecturers in the Department of English Language and Literature. The native language of the translators is Turkish.

Content Validity

After the translation process was completed, the scale was presented to an expert group consisting of ten nurse-midwife academicians. The experts whose opinions were obtained via e-mail inspected the comprehensibility and cultural compatibility of the scale items. Davis Technique was used for content validity based on expert opinion. Experts rated items on a Likert-type scale using the Davis Technique in which the scores ranged from 1 to 4, as "Not relevant" (1), "Needs revising" (2), "Relevant but needs a little revising" (3), and "Highly relevant" (4). Followingly, the total of the first two ratings was divided by the number of experts, and the content validity index (CVI) was obtained. A CVI greater than 0,80 indicated sufficient content validity.

Pilot Scheme

At this stage, the scale was administered to 15 individuals under a pilot scheme, and they were asked to evaluate the items in terms of intelligibility, fluency and other issues that attracted their attention.

Data Collection Tools

Demographic information form and the Colorectal Cancer Fatalism Scale were used in the study. Demographic information form: The form consists of eight questions: age, gender, educational level, marital status, income status, health insurance, employment status and chronic diseases. Colorectal Cancer Fatalism Scale: The scale was first developed by Barbara Powe for the African-American community in 1995 and consists of 15 'yes' or 'no' questions. Higher scores indicate increasing levels of fatalism. The scores that can be obtained from this scale range between 0 and 15. The scale exhibits a single-factor structure, has no sub-dimensions and can be filled in 5-10 minutes. The scale is suitable for all social classes. The author who developed the scale sought to identify a pattern between colorectal cancer fatalism and preventive

health behaviors. The author thereby aimed to help individuals by evaluating potential and cognitive barriers in the use of health services and in the practice of a healthy life.[16]

Evaluation of Data

The data were analyzed with the SPSS for Windows 22 and LISREL 8,80 package software. Data were expressed as numbers, percentages, minimum and maximum values, mean and standard deviation. There is no missing data in the study. Davis technique was used to assess content validity, and the content validity index (CVI) was calculated. Exploratory and confirmatory factor analyses were performed on the obtained data. Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were analyzed using exploratory factor analyses. x2/SD, GFI, AGFI, CFI, RMSEA and SRMR fit indices were used in confirmatory factor analysis. Moreover, internal validity of the scale was verified by using the KR-20 coefficient.

Ethical Aspects of Research

Verbal and written consents were obtained from the participants after they were informed about the purpose of the study. The study was carried out pursuant to the Declaration of Helsinki.Permission was obtained from the author who developed the scale and the ethics committee (with the date 18/04/2016 and decision number 09) before the data were collected. This study was presented as a poster presentation at the 1st international and 4th National Transcultural Nursing Congress held in Sanliurfa on October 21-24, 2017. This study was supported by Atatürk University Scientific Research Projects Coordination Unit (BAP) with the project number 2016/123 and produced from a master's thesis.

Limitation

Collection of study data from a single province can be considered as a limitation.

RESULTS AND DISCUSSION

56% of the participants are male, 30% are primary school graduates and 83% are married. 83% of the participants have health insurance, 49% have income equal to their expenses and 31% are housewives. 63% of the participants do not have any chronic diseases, and the mean age is 53,79±9,29 years (Table 1).

The study aims to assess the Turkish validity and reliability of the Colorectal Cancer Fatalism Scale in terms of content validity, construct validity and internal validity.

Results on Content Validity

After the translation process of the Colorectal Cancer Fatalism Scale, the validity and reliability of which were assessed, the scale was firstly submitted for opinion of 10 experts for evaluation including cultural equivalence in order to ensure content validity. With expert opinion, the CVI scores of the Colorectal Cancer Fatalism Scale items, whose content validity was evaluated using the Davis technique, ranged from 0,8 to 1,0.

Therefore, no item was eliminated from the scale with respect to content validity, and the pilot scheme was started.

Pilot Application

The scale was piloted to fifteen individuals to see whether there were any difficult or incomprehensible items. Therefore, no correction was required from the participants or researchers at this point.

Results on Construct Validity

A KMO coefficient was calculated to assess the suitability of the data obtained by the scale for factor analysis, and the Bartlett sphericity test was applied to the data. According to the findings, the KMO coefficient was calculated as 0,854. As a result of the analysis, the Bartlett sphericity test confirmed the significance of data (x2=1084,23, p=0,000). To assess whether the calculated KMO value and the data set were suitable for exploratory factor analysis, the anti-image correlations of the scale items were examined. All items were found to meet sample validity criterion.

Factors, items, factor loadings, and explained variance for the Colorectal Cancer Fatalism Scale are presented in Table 2. Looking at Table 2, it can be seen that the Colorectal Cancer Fatalism Scale exhibits a single sub-dimension structure, which is similar to the original structure. Factor loads of all items are above 0,30 and the total variance explained is 34,77%. Therefore, no items were removed from the scale at this stage, and a single sub-dimensional structure was accepted. The scales in the study were then subjected to confirmatory factor analysis and structural equation modeling to obtain more precise findings following exploratory factor analysis.

Table 1. Demographic Characteristics of The Participants (n=200)

		n	%
Gender	Women	88	44,0
	Men	112	56,0
Education	Illiterate	29	14,5
	Literate	23	11,5
	Primary school	60	30,0
	Secondary school	28	14,0
	High school	34	17,0
	University+	26	13,0
Marital status	Married	166	83,0
	Single	34	17,0
Health insurance	Yes	165	83,0
	No	35	17,0
Income	Income less than expenses	89	44,5
	Equal income and expenses	98	49,0
	Income more than expenses	13	6,5
Profession	Unemployed	5	2,5
	Officer	36	18,0
	Worker	23	11,5
	Retired	29	14,5
	Housewife	62	31,0
	Other	45	22,5
Chronic disease	Yes	74	37,0
	No	126	63,0
	Min-Max	**Mean**	**SD.**
Age	40-77	53,79	9,29

Table 2. Factor Analysis Result of The Colorectal Cancer Fatalism Scale

Items	Factor Load
1. I think if someone is meant to have bowel cancer, it doesn't matter what kinds of food they eat, they will get bowel cancer anyway.	0,706
2. I think if someone has bowel cancer, it is already too late to get treated for it.	0,697
3. I think someone can eat fatty foods all their life, and if they are not meant to get bowel cancer, they won't get it.	0,622
4. I think if someone is meant to get bowel cancer, they will get it no matter what they do.	0,704
5. I think if someone gets bowel cancer, it was meant to be.	0,639
6. I think if someone gets bowel cancer, their time to die is soon.	0,502
7. I think if someone gets bowel cancer, that's the way they were meant to die.	0,387
8. I think getting checked for bowel cancer makes people scared that they may really have bowel cancer.	0,334
9. I think if someone is meant to have bowel cancer, they will have bowel cancer.	0,592
10. I think some people don't want to know if they have bowel cancer because they don't want to know they may be dying from it.	0,312
11. I think if someone gets bowel cancer, it doesn't matter whether they find it early or late, they will still die from it.	0,571
12. I think if someone has bowel cancer and gets treatment for it, they will probably still die from the bowel cancer.	0,535
13. I think if someone was meant to have bowel cancer, it doesn't matter what doctors and nurses tell them to do, they will get bowel cancer anyway.	0,678
14. I think if someone is meant to have bowel cancer, it doesn't matter if they eat healthy foods, they will still get bowel cancer.	0,688
15. I think bowel cancer will kill you no matter when it is found and how it is treated.	0,659
Explained variance (%)	**%34,771**

GÜSBD 2024; 13(2): 590 - 598
GUJHS 2024; 13(2): 590 - 598

Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi
Gümüşhane University Journal of Health Sciences

Araştırma Makalesi
Original Article

Results on Confirmatory Factor Analysis

Various indices were utilized to examine the conformity of the Colorectal Cancer Fatalism Scale model. Among these, x2/SD value was found as 1,13, GFI as 0,99, CFI as 0,99, RMSEA as 0,056, and SRMR as 0,010. All conformity indices were assessed, and the model was considered acceptable. In Figure 1, item factor loadings in the Colorectal Cancer Fatalism Scale are presented in the form of a PATH diagram. As seen in Figure 1, the model was accepted as it was in its original structure without any modifications. Factor loads of the model range from 0,30 to 0,69, and the t value is above 1,96 (2,49-10,90) for all items. No modifications were applied to improve the model (Figure 1).
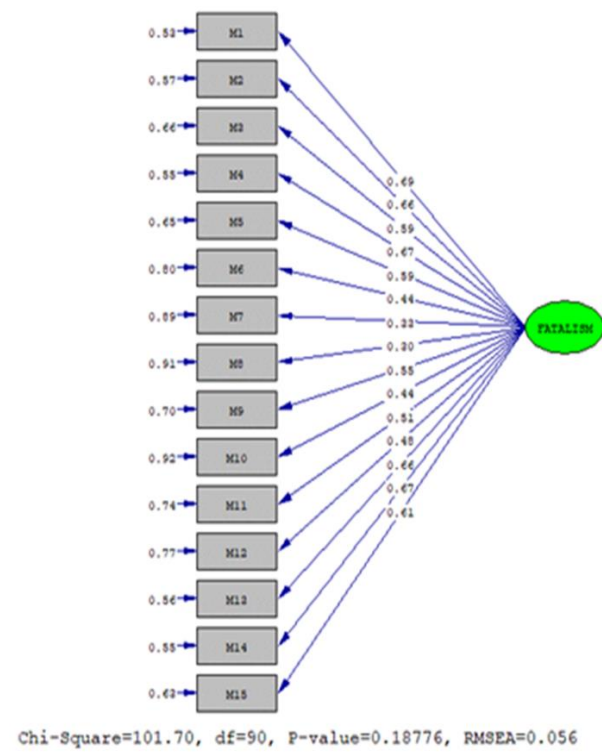

Chi-Square=101.70, df=90, P-value=0.18776, RMSEA=0.056

Figure 1 PATH diagram for the Colorectal Cancer Fatalism Scale

Results on Internal Validity

In Table 3, the Colorectal Cancer Fatalism Scale's item averages, item-total correlations, and Cronbach's α coefficients if the item is deleted are presented. Total Colorectal Cancer Fatalism Scale KR-20 coefficient is 0,80,

item-total correlations for all items of the scale are positive, and elimination of any item does not cause a significant increase in the KR-20 coefficient. For this reason, no items were removed from the scale at this stage (Table 3).

Participants received a mean score of 7,28±3,70 from the Colorectal Cancer Fatalism Scale, with the scores ranging from 0 to 15. Participants obtained the lowest score from the items; "I believe if someone gets colorectal cancer that's the way they are meant to die" and "I believe if someone gets colorectal cancer it doesn't matter when they find out about it, they will still die". They obtained the highest score from the item "I believe if someone gets colorectal cancer it is meant to be".

Table 3. Total Item Correlations and Values of KR-20 of Turkish Version of Colorectal Cancer Fatalism Scale

Items	Mean	SD	Average of scale if item is deleted	Adjusted item-total score correlation	When the item deleted coefficient KR-20
1.	0,56	0,50	6,715	0,578	0,773
2.	0,41	0,49	6,865	0,597	0,771
3.	0,49	0,50	6,785	0,505	0,779
4.	0,64	0,48	6,635	0,557	0,775
5.	0,73	0,45	6,550	0,491	0,780
6.	0,36	0,48	6,915	0,428	0,785
7.	0,30	0,46	6,980	0,328	0,792
8.	0,45	0,50	6,830	0,227	0,832
9.	0,70	0,46	6,580	0,440	0,784
10.	0,59	0,49	6,690	0,210	0,831
11.	0,30	0,46	6,980	0,532	0,777
12.	0,38	0,49	6,900	0,464	0,782
13.	0,51	0,50	6,770	0,562	0,774
14.	0,56	0,50	6,720	0,568	0,773
15.	0,34	0,48	6,935	0,631	0,769
KR-20					**0,798**

Translation of scales developed for specific target groups into a different language and

adapting them to a new culture is a frequently used technique.[19] In the literature, it is recommended that translation is performed by two or more independent individuals fluent in the original language of the scale as well as well-informed about the cultural and linguistic characteristics of the adapted language. Followingly, a "reverse" translation method is applied by an expert who is unfamiliar with the original version of the scale, and the final version is shaped in line with expert opinions.[19, 20] Content validity of the scales taken through expert panel is done by Davis technique. Content Validity Index (CVI) score is determined by the scores obtained with this technique. Calculated content validity index is expected to be >0,80 in a panel of 10 experts.[21, 22] In the present study, the Colorectal Cancer Fatalism Scale was e-mailed to 10 experts working in the field of nursing who were experienced in scale development or adaptation studies. Upon review, it was determined that two items got 0,8, two items 0,9 and the remaining 11 items got full points (1,0). No item was eliminated since all items in the scale met the condition of being >0,80 as stated in the literature.

Factor analysis is one of the most frequently used methods to demonstrate construct validity.[21, 23] Factor analysis is not actually a measurement tool, but an indication that the data obtained from the measurement tool exhibit construct validity.[24] In cases where a measurement tool is translated into a different language or applied to different target groups from the original study group, no statistical analysis can be done before factor analysis is performed and evidence is collected for data validity. Since all statistical analyses depend on the precondition that the data are valid, data validity should be examined before performing any statistical test.[25] Factor analysis is performed with two different methods: Exploratory Factor Analysis and Confirmatory Factor Analysis.[21, 26] The higher the variance explained in the factor analysis is, the better the scale is thought to measure the relevant behavior or dimension.[27] Factor loads are recommended to be 0,30 and above.[28, 29] The results of factor analysis reveal to us that the scale exhibits a single factor structure. On the other hand, the item factor loads vary between 0,31 and 0,71 while the explained variance is 34,77%, which are interpreted as meeting desired characteristics in the exploratory factor analysis.

Confirmatory factor analysis (CFA) is another construct validity analysis to examine whether the obtained data comply with the theoretical structure or not. Obtained fit index results demonstrate the compatibility of the model with the theory. Considering the fit index results, the value obtained by dividing the chi-square value by the degrees of freedom is expected to be two or below. GFI, AGFI and CFI values range between 0 and 1. The index results are considered normal if above 0,95.[18, 30] A RMSEA value below 0,05 is accepted normal, whereas a value below 0,08 is deemed acceptable fit.[21, 30, 31] Considering the fit indices of the Colorectal Cancer Fatalism Scale, x2/SD value was found 1,13, GFI 0,99, AGFI 0,99, CFI 0,99, and SRMR 0,010, which were within normal ranges, whereas the RMSEA value of 0,056 corresponded to acceptable fit. Path diagram and associated t values obtained as a result of confirmatory factor analysis were also examined. A t value above 1,96 is considered to be of significance at the 0,05 level.[30] Examination of the path diagrams and t values revealed that all values were greater than 1,96. As a result, a statistically significant relationship was determined at the 0,05 level between the items and factors of the Colorectal Cancer Fatalism Scale. Review of the analyses showed that the Colorectal Cancer Fatalism Scale provided the necessary construct validity as a result.

Reliability is required for the standardization of measurement tools. A scale failing to provide reliability is considered useless and of low scientific value.[21] Internal validity analysis was applied to ensure the reliability of the Colorectal Cancer Fatalism Scale. While determining the internal consistency of Likert-type scales, the most commonly used method is the Cronbach α Reliability Coefficient method, while the Kuder Richardson 20 (KR-20) formula is used

for binary scales (yes-no). It is used to question the homogeneity of each item and sub-dimension in the scale. Higher KR-20 values mean higher consistency between the scale items and greater homogeneity in terms of the features to be measured. KR-20 values between 0 and 0,40 are considered to imply no reliability, whereas the values between 0,40 and 0,60 imply low reliability, the values between 0,60 and 0,80 imply moderate reliability, and those between 0,80 and 1,00 imply high reliability.[18, 19, 21, 30] The KR-20 coefficient of the original scale is 0,87. On the other hand, we obtained a value of 0,80 in our study, which shows that the scale is highly reliable.

Item-total score correlation was examined for internal consistency as an alternative method. This method is used to assess conformity for each item and decide whether or not modifications should be made. Although correlation coefficients differ in the literature, it is emphasized that they should be 0,30 and above.[21, 30] In the present study, the item-total score correlation coefficients range from 0,210 and 0,631. The item-total correlations for all items are positive, and elimination of any item does not cause a significant increase in the KR-20 coefficient. Therefore, no items were removed from the scale at this stage.

CONCLUSION

The scale has a single factor in Turkish as in its original language, has no sub-dimensions, and consists of 15 questions. The construct validity and internal validity findings show that the Colorectal Cancer Fatalism Scale is a valid and reliable scale for Turkish community. At each application, the scale's internal validity should be re-analyzed, and its conformity to the sample should be evaluated. The Turkish and approximate English translations of the scale items are presented in Appendix 1.

Financial Support

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