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Psychometric properties of the Treatment Decision Evaluation Scale in patients with cancer in Turkey

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A B S T R A C T

This paper is a report of a study to adapt the treatment decision evaluation scale for Turkish patients with cancer and to evaluate its psychometric properties. In 2006 a convenience sample of 199 patients with cancer at a Turkish university hospital completed a structured questionnaire including demographic characteristics and the treatment decision evaluation scale for patients with cancer. Item analysis, principal component analysis, internal consistency reliability, Cronbach's alpha, paired *t*-test and correlations were used to measure the psychometric properties of the items of the scale. In the assessment of construct validity, there were identified three factors with eigenvalues greater than 1 explained 43.3% of the total variance (Satisfaction–Uncertainty, Informed Choice and Decision Control). Factor analysis yielded that all of factor loadings were above 0.40 and factor loadings of the items ranged from 0.42 to 0.69 in the scales. Internal reliability coefficients of these three factors were found to be good, 0.74, 0.75 and 0.71, respectively. The present study provides evidence of the treatment decision evaluation scale's validity, reliability and acceptability in Turkish cancer patients. This scale should be further evaluated in different regions in Turkey and diverse populations. The scale has potential applications as it can be used both as a research or a regular treatment decision evaluation tool with clinical settings.

Introduction

Treatment decision is a general label that has been applied to different kinds of tools/instruments used to inform patients about available treatment options and their benefits and risks, and to structure the decision-making process in order to encourage patients to express their treatment preferences (Charles et al., 2005). To that end, much has been written during the past decade about the growing expectation of patients to participate in medical care and about informed choices in treatment decision making (Charles et al., 1997; O'Connor, 1997). Patient participation in treatment decision-making for cancer is associated with a variety of positive outcomes, including better quality of care (i.e., increased rates of surgeons' referral to medical oncologists for adjuvant treatment) (Siminoff et al., 2000), better quality of life (Andersen and Urban, 1999; Street and Voigt, 1997), and greater satisfaction with medical care (Moyer and Salovey, 1998). However, previous research has shown that older breast cancer patients were less willing than their younger counterparts to participate in treatment decision-making processes (Degner et al., 1997; Petrisek et al., 1997; Wallberg et al., 2000) and were actually less prepared with treatment decisions (Bruera et al., 2002).

The extent to which patients with cancer want to be involved in treatment and care decisions has recently been investigated, in the same way that studies have been performed in patients with breast cancer (Degner et al., 1997; Hack and Denger, 1999), and prostate cancer (Davison and Denger, 1997). Such decision-related evaluations have been found to be associated with treatment choices or treatment choice intentions (Unic et al., 2000). There are various scales about treatment decisions, one of which is the Treatment Decision Evaluation Scale.

The Treatment Decision Evaluation Scale was developed by Stalmeier et al. (2005) in the Netherlands. The scale consisted of the Satisfaction–Uncertainty, the informed choice and the decision control subscales. These subscales and their associated needs formed a 15-item questionnaire. A five-point response scale ranging from 'strongly disagree' (1) to 'strongly agree' (5) was used. In view of the item content and the factor loadings, these subscales were labelled as Satisfaction–Uncertainty, Informed Choice, and Decision Control. Higher scores on the Satisfaction–Uncertainty scale indicate higher satisfaction, and thus lower uncertainty. The reliabilities (Cronbach's alpha) of the three subscales were

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0.79, 0.85, and 0.75, respectively. The three subscales reflected 39%, 12%, and 8% of the total variance. Factor loadings of the items in the three subscales ranged from 0.43 to 0.84. The correlations between the scales were moderate (Satisfaction–Uncertainty, Informed Choice) $r = 0.52$, (Satisfaction–Uncertainty, Decision Control), $r = 0.56$, and (Informed Choice, Decision Control) $r = 0.41$.

Healthcare researchers who work with culturally diverse communities need to be aware that the measurement of the treatment decision evaluation may vary in different cultural groups. Therefore, the treatment decision evaluation may be the best representation of the constructs of treatment decisions from a Turkish perspective, and thus may be culturally sensitive. Turkish women do not play an important role in the division of responsibility within the family and subsequently experience difficulties in making some decisions about serious family issues and problems about health whereas Turkish men are the dominant force in health care and treatment decisions (Erci, 2003; Aytekin et al., 2001). Because these commonly described Turkish cultural values may influence the measurement of treatment decision evaluation, this study was conducted to determine whether the scale structure of the treatment decision evaluation in its present form taps into these culturally salient values, and thus whether it is appropriate for use with Turkish patients with cancer. Cross-cultural influences affect people's perceptions and health practices and are areas of concern and study for nurses and other health professionals. Because of the cultural diversity of many countries, culturally sensitive assessment methods are needed.

This paper describes the psychometric evaluation of a self-report scale, the treatment decision evaluation scale which was designed to measure the treatment decision making of cancer patients. Specifically, this study aimed to:

(1) assess content and construct validity and
(2) determine the internal reliability of the treatment decision evaluation scale.

Material and methods

Design

The phases of the testing of the scale were: (1) translation of the scale into the Turkish language from its English version and back-translation into English; (2) content analysis by a panel of specialists; and (3) pre-test and psychometric testing (factor analysis, reliability coefficient and inter-item correlations).

Participants

These consisted of 199 patients with cancer at a university hospital medical oncology department in Turkey and were selected through convenience sampling. The eligibility criteria were: (1) being registered with a primary diagnosis of cancer in the oncology clinic; (2) aged 18 years or over (3) able to read and understand the Turkish language and (4) no history of psychiatric illness.

Translation procedures

Researchers should recognize the methodological issues involved in the use of translation as well as in data analysis of equivalency (Carlson, 2000). When translating an existing instrument, the back-translation method has been considered the preferred method of obtaining a culturally equivalent instrument (Erkut et al., 1999). For the instrument used in the study, the back-translation technique was used to translate the Turkish version back into English.

In the first instance, the treatment decision evaluation scale (Stalmeier et al., 2005) was translated into Turkish. Then, the Turkish version of the treatment decision evaluation scale was translated into English by two Turkish lecturers (fluent in English) who worked independently on the translation. The two translated versions were compared by the author and analysed until there was a consensus regarding the initial translation. Their initial translation into Turkish was back-translated into English. The translation phase had the purpose of checking for discrepancies between the content and meaning of the original version and the translated instrument. All of the versions were evaluated by the authors and a final version was formed.

Content validity

To test item clarity and content validity, the translated version was submitted to a panel of seven specialists. They were informed about the measures and concepts involved by the author. This multidisciplinary panel comprised two public health specialists, two experts who had published papers on cancer and three nurses who had conducted research in the oncology setting. Each of the panel members was asked to evaluate the content of the final translated version of the treatment decision evaluation scale compared to the original instrument. The experts were asked to evaluate each item of the scale by using a five-point likert scale: 5, strongly agree; 4, agree; 3, do not agree/do not disagree; 2, disagree; 1, strongly disagree.

Pre-test

The final version of the translated instrument was pre-tested with a pilot group of 30 patients from the medical oncology clinics. The pre-test was conducted at the outpatient and inpatient medical oncology clinics where the main study was to be carried out. To simplify the recording of completion difficulties and suggestions concerning the scale, a questionnaire for this phase was used. The questionnaire also requested general information from the interviewee such as gender, age, civil status and occupation. An open-ended question to record completion difficulties and suggestions was provided for each one of the items.

Psychometric testing

Internal consistency and homogeneity

Cronbach's alpha was calculated to determine internal consistency. Polit and Beck (2005) indicate that internal consistency may be a necessary condition for homogeneity or unidimensionality of a scale and Cronbach's alpha should be 0.70 and more. Furthermore, the item-total correlations and the mean inter-item correlations were included in the analysis. Polit and Beck (2005) recommended using the inter-item correlation as a criterion for internal consistency. This should be greater than or equal to 0.15. They pointed out that this average value could be a bias and all individual inter-item correlations should be within these limits. One can only be ensured of undimensionality if all individual inter-item correlations are clustered closely around the mean inter-item correlation.

Stability

The stability of the scale was established by measuring the test–retest reliability. In this study the respondents completed the same instrument again after four weeks. Based on a code each respondent received, the respondent's data of the first and second measurements could be matched, allowing the test–retest reliability to be calculated.

Construct validity

The data were analysed using factor analysis (principal component analysis with varimax rotation). To attain the best

fitting structure and the correct number of factors, the following criteria were used: eigenvalues higher than 1.0, factor loadings higher than 0.40 and the so-called 'elbow criterion' regarding the eigenvalues (Polit and Beck, 2005). Before conducting the factor analysis of the treatment decision evaluation scale, the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) and Bartlett's test were calculated to evaluate whether the sample was large enough to perform a satisfactory factor analysis. The KMO measures the sampling adequacy and it should be greater than 0.50 for a satisfactory factor analysis to proceed.

Ethical considerations

Permission to undertake this study was gained from the ethical committee at the Health Science Institute of Atatürk University and informed consent was obtained from each participant. The patients were informed about the purpose of the research and were assured of their right to refuse participation or to withdraw from the study at any stage. The anonymity and confidentiality of participants was guaranteed.

Procedure and data collection

The researchers visited the oncology clinic on five working days every week and conducted interviews with the patients. The questionnaire was explained to the participants, who then read it and marked their answers on the sheets. The questionnaire took approximately 15 min to complete and could be understood by people with minimal reading ability. Patients completed the questionnaire in a separate quiet room of the oncology clinic to ensure they correctly understood items in the questionnaire. All of the participants found the questionnaire understandable and easy to complete. Test–retest of the scale was conducted with 32 of these patients after four weeks.

Data analysis

Mean, standard deviation, median and mode were used to summarise the data Pearson's product–moment correlations were calculated to determine item-total score correlations. A principal component factor analysis was used to explore the scale's construct validity and factor loadings of items of the scale. This analysis enables specification of the method of factor extraction, and it can either retain all factors whose eigenvalues exceed a specified value or retain a specific number of factors. Cronbach's alpha was calculated to establish internal consistency reliability of the scale. This test calculates a number of commonly used measures of scale reliability, and also provides information about the relationships between individual items in the scale. Paired-sample *t*-tests (95% confidence interval) were used to examine differences in test and retest scores of the scale and its subscales. Bivariate correlations were used to determine whether a relationship exists between scores of the treatment decision evaluation scale and its subscales and to sample some characteristics.

Results

Research population

The instrument was completed by 199 patients. The demographic and disease/treatment characteristics of the participants are shown in Table 1. The majority of the sample was at stage-II of cancer. Ninety-two percent of them were married and 44.2% had graduated from primary school. The mean duration of cancer since diagnosis was 3.5 ± 2.8 years. The majority of the patients had received chemotherapy (Table 1).

Table 1
The demographic and disease/treatment characteristics of the participants.

Demographic characteristics ($n = 199$)	$X \pm SD$	
Diagnosis duration (years)	3.5 ± 2.8	
Age (years)	52.2 ± 13.9	
Monthly income of family (US $)	476.6 ± 262.9	
The number of children	5.4 ± 3.0	
Gender	*N*	%
Women	93	46.7
Men	106	53.2
Education level	*N*	%
<Primary school	74	32.7
Primary school	88	44.2
High school	31	15.6
University	6	3.0
Marital status	*N*	%
Married	183	92.0
Single	16	8.0
Employment situation	*N*	%
Employed	46	22.6
Unemployed	154	77.4
Cancer site	*N*	%
Digestive system	73	36.7
Breast	26	13.1
Lung	35	17.6
Head–neck	10	5.0
AML. ALL. NHL	26	13.1
Gynaecologic	16	8.0
Urinary tract	3	1.5
Other	10	5.0
Treatment characteristics	*N*	%
Radiotherapy	4	2.0
Chemotherapy	145	72.9
Radiotherapy and chemotherapy	14	7.0
Chemotherapy + surgery + radiotherapy	31	15.6
Chemotherapy + surgery	5	2.5
Stage of cancer	*N*	%
I	6	3.0
II	137	68.8
III	39	19.6
IV	17	8.5
Total	199	100.0

Table 2 shows that scores of the scales and its subscale were distributed well and the mean scores were very close to the median score of the subscales and the total scale. The mean scores of the items for the three subscales of the treatment decision evaluation scale ranged from the lowest–the informed choice–with a mean of 13.7 ± 3.4 points to the highest–the decision control–with a mean of 17.8 ± 3.5 points (Table 2). The scores showed that satisfaction with the treatment decision of the patients was low.

There were statistically significant positive associations between the decision control subscale and educational level or marital status. The relationship between the decision control subscale and stage of cancer was negative. Age, gender, the number of children, monthly income of family and diagnosis duration were not associated with the treatment decision evaluation scale and its subscales (Table 3).

Content validity

The translated scale, consisting of 15 items, was judged by the expert panel on relevance and phrasing of the instrument items. For each item, experts could suggest possible improvements in wording. Subsequent wording revisions of the Turkish instrument were made and discussed each time by the panel members until agreement about the content was reached. The panel then

Table 2
The scores distribution of treatment decision evaluation scale and its subscales.

Descriptive Statistics	The treatment decision evaluation			
	Satisfaction–Uncertainty	Informed choice	Decision control	Total scale
Total mean ± SD	14.1 ± 3.4	13.8 ± 3.3	17.8 ± 3.5	45.7 ± 5.4
Item mean ± SD	2.8 ± 0.6	2.7 ± 0.6	3.5 ± 0.7	3.0 ± 0.3
Minimum	5.00	5.00	9.00	33.00
Maximum	24.00	23.00	25.00	61.00
Median	14.0	14.0	18.0	46.0
Mode	14.0	14.0	20.0	46.0

reviewed the content of the Turkish version of the scale until it was deemed satisfactory.

Construct validity

The KMO score was calculated to ascertain whether the sample was large enough to perform factor analysis. The calculated KMO was 0.73 indicating that the sample was large enough to perform a satisfactory factor analysis. The first step of the factor analysis was a principal component analysis. The analysis revealed three factors with an eigenvalue higher than 1 (Table 4). All of the factor loadings were above 0.40 and factor loadings of the items ranged from 0.42 to 0.69 in the current study. The principal components analysis was used in order to explain the variations of the total scale and its factors. The three factors together explained 43.37% of the variance and Cronbach's alpha of the total scale was 0.71. For the first factor, factor loadings of the scale's items were found to deal with Satisfaction–Uncertainty. This factor explained 21.15% of the variance. Item loadings of the second factor with an alpha of 0.75 were found to be related to the informed choice. This factor explained 11.91% of the total variance. Factor loadings of the scale's items were related with treatment decision evaluation explaining 10.3% of the total variance (Table 4).

Internal consistency

The alpha values of the three factors were 0.74, 0.75 and 0.71, respectively. The corrected item-total correlations were adequate criteria for the items and the item-total correlations ranged from 0.36 to 0.71.

Thirty-two patients from the same sample group took part in the test–retest reliability assessment. Pearson correlations for test–retest reliability were $r = 0.74$ for the treatment decision evaluation, $r = 0.71$ for the Satisfaction–Uncertainty, $r = 0.78$ for the informed choice, and $r = 0.70$ for the decision control retest all of which are considered good.

Table 3
The correlations between the sample characteristics and the subscales of the scale.

Some Demographic characteristics	The treatment decision evaluation			
	The satisfaction-uncertainty	The informed choice	The decision control	Total
	r	*r*	*r*	*r*
Age	0.076	0.025	−0.205	−0.070
Gender	0.015	0.031	0.110	−0.94
Monthly income of family	−0.104	−0.005	0.112	0.005
The number of children	−0.017	0.061	−0.103	−0.040
Diagnosis duration	0.032	−0.121	−0.012	−0.063
Education level	−0.037	−0.151	0.232**	0.033
Employment situation	−0.027	0.013	−0.079	−0.061
Marital status	0.047	−0.076	0.199**	0.113
Treatment characteristic	0.099	0.113	−0.095	0.071
Stage of cancer	0.046	0.097	−0.176*	−0.025

*$p < 0.05$; **$p < 0.01$.

Table 4
Rotated factor loadings of items of the scale ($n = 199$).

Items of the scale	Factor 1	Factor 2	Factor 3
	Satisfaction–Uncertainty	Informed choice	Decision control
I am still doubtful about my choice	0.450		
I am satisfied with my decision	0.698		
I find it hard to make this choice	0.423		
This is my own decision	0.434		
I expect to stick with my decision	0.511		
I know the pros and cons of the treatments		0.502	
I made a well informed choice		0.572	
I am satisfied with the information I received		0.507	
I want a clearer advice		0.658	
I want more information about this decision		0.525	
My decision frightens me			0.699
I wish someone else would decide for me			0.406
This decision is made without me			0.460
I feel pressure from others in making this decision.			0.580
I regret my decision			0.426
Alpha	0.74	0.75	0.71
Variance (%)	21.15	11.91	10.30

Discussion

When examined, scores of the scales and its subscale were evenly distributed and the mean scores were much closer to the median of the scale. The results of this study showed that the psychometric characteristics of the Turkish version of the treatment decision evaluation scale are promising. The panel review regarding the content of the Turkish version of the scale indicated that there was no need to modify its translation and content. The Cronbach's alpha, range of individual inter-item correlations (ranged from 0.36 to 0.71) and the homogeneity of the scale seemed to be sufficient. The original scale did not stress individual inter-item correlations (Stalmeier et al., 2005). The literature suggests that the acceptable minimum point for individual inter-item correlations is 0.30 (Erefe, 2002; Polit and Beck, 2004). The findings of the current study are consistent with the available literature. Factor analysis with varimax rotation indicated that, with regard to the content, three factors could be discerned: Satisfaction–Uncertainty, informed choice, and decision control dimensions. The original scale (Stalmeier et al., 2005) reported that same three dimensions. The findings of the current study are consistent with the results of Stalmeier et al. study.

In this study, age, gender, employment status, number of children, monthly income of family and diagnosis duration were not part of the treatment decision evaluation. Bruera et al. (2002) established that age, education, income, employment status or time since diagnosis were not found to be statistically significant with regard to patient decision-making. In the current study, there were statistically significant positive associations between the decision control subscale and education level or marital status. However, a negative relationship between the decision control subscale and current stage of cancer was found. Bruera et al. (2002) found that education level and marital status affected treatment decisions of patients with cancer. Degner et al. (1997) and Beaver et al. (1999) determined that the desired role in decision-making varied among patients with different stages of disease. Our results are also in line with those of others.

In the study, the three subscales explained 21.15%, 11.91%, and 10.3% of the total variance; Cronbach's alphas were 0.74, 0.75 and 0.71, respectively, for the three dimensions. Stalmeier et al. (2005) reported internal consistency reliabilities of the three scales being 0.79, 0.85 and 0.75, respectively. Stalmeier et al. (2005) also found that the three scales explained 39%, 12%, and 8% of the total variance of the 15 items. Published literature suggests that a reliability of 0.70 is considered acceptable (Erefe, 2002; Polit and Beck, 2004). In this study, internal consistency and explained total variance had adequate criteria. Our findings were similar to the results of the original scale and literature information.

When the items in the Turkish scale were compared to the original scale they were found to be the same in terms of linguistic equivalence. As a result of this, KMO was calculated to ascertain whether the sample was large enough to perform factor analysis. The KMO was 0.73 in this study. This finding indicates that the sample was large enough to for a satisfactory factor analysis and the further validation (factor solution) could be processed with similar sample size in the current study. Hence, the sample size in this study was adequate for factor analysis. Factor analysis yielded that all of the factor loadings were above 0.40 and factor loading of the items ranged from 0.42 to 0.69 in the scales. Stalmeier et al. (2005) determined that factor loadings ranged from 0.43 to 0.83 in the original scale. The acceptable minimum point of 0.40 for factor loading was achieved in the current scale (Polit and Beck, 2004).

Test–retest reliability of the scale was 0.74, and its subscales were 0.70–78. Stalmeier et al. (2005) did not report test–retest reliability for the original scale. According to the results of this study, construct validity of the scale was obtained. It is customary to state that measurements of repeatability for group comparisons should be at least 0.70 (Polit and Beck, 2005). The test–retest reliability was adequate for the scale and its subscales.

Implication in practice

The development of valid scales is a complex procedure. The treatment decision evaluation scale is very important because it provides standardized data in the treatment decisions evaluation with cancer. In order to ensure the quality of adapted instruments, international norms should be followed. The application of a methodology accepted by the scientific literature makes available the comparison of the data obtained in different languages. The Turkish version of the scale will allow identification of patients with cancer to evaluate their treatment decisions. Assessment of the treatment decisions of patients with cancer should be an essential part of nursing practice. In this way patients are empowered in the treatment decision-making process, and may feel themselves to be more actively involved in their own health care. Further study and development may lead to the identification of treatment decision evaluations that would improve the Turkish version of this scale.

The adapted scale meaningfully measured treatment decision evaluations in a Turkish community, and thus it is potentially a culturally sensitive and valid instrument that can be applied in healthcare. Looking specifically at the items in the Turkish scale compared with the original scale, cultural characteristics may not have been an influencing factor. Hence, this scale may have good cross-cultural applicability.

Conclusion

This study confirmed the reliability and validity of the scale in this sample of Turkish patients with cancer. The Turkish version of the treatment decision evaluation scale has shown statistically acceptable levels of reliability and validity. The scale is important because it provides standardized data in the treatment decision evaluation with cancer. The application of a methodology accepted by the scientific literature makes available the comparison of the data obtained in different languages.

It is recommended that this scale should be further evaluated both in different regions of Turkey and in diverse populations. Once a valid and reliable scale is ready to be used, it can be used to measure outcomes in an intervention study and, as mentioned above, be tested in different cultures.

Conflict of interest statement

The authors disclose no financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work (Psychometric Properties of Treatment Decision Evaluation Scale in Cancer Patients).

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