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Reliability and Validity of the Turkish Version of Multidimensional Quality of Life Scale – Cancer Version 2 in Patients With Cancer

KEY WORDS

Cancer patients
MQOLS-CA2
Quality of life
SF-36

This study examined the reliability and validity of the Turkish version of the Multidimensional Quality of Life Scale – Cancer Version 2 (MQOLS-CA2) in 72 people with cancer. The results indicated that the MQOLS-CA2 has good construct validity. Factor analysis confirmed the presence of 5 factors in the MQOLS-CA2: psychological well-being, physical well-being, nutrition, symptom distress, and interpersonal well-being. The correlation between the global scores of the MQOLS-CA2 and Medical Outcomes Study 36-Item Short Form Health Survey was significant ($r = 0.78$, $P = .0001$), supporting the criterion validity of the MQOLS-CA2. Results of the test-retest method showed that stability coefficients for the 5 subscales of the MQOLS-CA2 ranged from 0.56 (symptom distress) to 0.91 (general physical well-being). Cronbach alpha coefficients surpassed the 0.70 criterion for all subscales, indicating good internal consistency. The acceptability rate was excellent at 96% completed questionnaires. In conclusion, the findings suggest that the Turkish version of the MQOLS-CA2 is a valid and reliable instrument that can be used in cancer research.

A comprehensive evaluation of the quality of life (QOL) of persons with cancer provides information about the impact of the disease. A multidimensional measure of QOL also provides information that can be used to direct patient care, education, and counseling in order to sustain a person's physical and psychological well-being.

Over the past 2 decades, numerous measures of general health-related QOL were developed including the Euro Quality of Life Scale,¹ Nottingham Health Profile,² Medical Outcomes Study 36-Item Short Form Health Survey (SF-36),³ and Sickness Impact Profile.⁴ These measures do not include disease-specific content or content related to cancer symptoms (eg, nausea,

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Accepted for publication March 9, 2004.

fatigue). As a result, disease-specific instruments were developed for use in patients with cancer (eg, Missoula-VITAS Quality of Life Index,⁵ McGill Quality of Life Questionnaire,⁶ EORTC Core Questionnaire,⁷ and Multidimensional Quality of Life Scale – Cancer 2 Version [MQOLS-CA2]⁸).

Almost all of the instruments mentioned above measure similar QOL domains, although different labels were given to similar constructs like social/family well-being and interpersonal well-being. The different ways that QOL was conceptualized contributed to the different dimensions attributed to the construct, as well as the cultural and professional background of the person(s) who developed the measure.

The MQOLS-CA2, developed by Padilla, operationalized QOL as a personal statement of the positivity or negativity of attributes that characterize one's life.⁸ The MQOLS-CA2 includes 5 QOL dimensions: psychological well-being (PSY), general physical well-being (PHY), nutrition (NUT), symptom distress (SYM), and interpersonal well-being (INT).

Although some studies on QOL explored the use of Turkish versions of different instruments with different disease groups,^{9–12} there is no validated cancer-specific measure of QOL for cancer patients in Turkey. Therefore, we aimed to determine the suitability of the MQOLS-CA2 for assessing QOL in patients with cancer. Reasons for choosing the MQOLS-CA2 included the following: (1) it is a widely used measure of QOL; (2) it includes critical QOL domains related to cancer; (3) the scoring system is practical; (4) it has been revised several times since its development; (5) its validity and reliability in different groups with cancer are satisfactory^{13–18}; and (6) we were given permission to translate it into Turkish and use it.

■ Methods

Setting

The study was performed in 2 outpatient oncology clinics at a state hospital in Istanbul, Turkey.

Sample

A potential sample of 159 cancer patients who visited 2 outpatient oncology clinics between June 15, 2000 and September 15, 2000 met the following inclusion criteria: they were (1) at least aged 18 years, (2) able to complete the questionnaire, and (3) free of any other comorbidity. A random sample of these 159 patients' hospital chart codes was used to identify 75 patients who were asked to participate. Seventy-two patients provided informed consent and were included in the study.

Instruments

MULTIDIMENSIONAL QUALITY OF LIFE SCALE – CANCER2

In 1992, Padilla developed the MQOLS-CA2 from a previous version of the MQOLS.⁸ The MQOLS-CA2 includes 33 items that assess 5 QOL dimensions: psychological well-being

(PSY: 12 items), general physical well-being (PHY: 7 items), nutrition (NUT: 4 items), symptom distress (SYM: 5 items), and interpersonal well-being (INT: 5 items). The MQOLS-CA2 uses 100 mm linear analogue scales. The ends of a line are anchored with words that denote an extreme positive or negative response. The anchor denoting the poorest QOL is the zero end of the scale while the anchor denoting the best QOL marks the 100 mm point. The respondent marks an "X" on the line or intersects "/" the line at the point that most closely reflects how the individual feels at the time. The distance, in centimeters, between the zero end of the line to the "X" provides the score for each item. To avoid a response set, the zero end of the scale may be on the right or left hand side. Total or subscale scores are obtained by summing the items in the total scale or in each of the subscales and dividing by the number of items in the total scale or relevant subscale. This provides a score from 0 to 100, which is easy to understand, easy to compare to other subscales of different item lengths, and easy to check for errors in coding. A higher score indicates a better QOL.

THE MEDICAL OUTCOMES STUDY MOS 36-ITEM SHORT FORM HEALTH SURVEY (TURKISH VERSION)

The SF-36,³ developed by Ware and Sherbourne, was designed for use in clinical practice and research, health policy evaluations, and general population surveys. The SF-36 includes 1 multi-item scale, which assesses 3 major health attributes and 8 health concepts: (1) functional status (physical functioning, social functioning, role limitations attributed to physical problems, role limitations attributed to emotional problems); (2) well-being (mental health, energy/fatigue [vitality], pain); and (3) overall evaluation of health (general health perception).

In total, 35 of the items contribute to these states and a further unscaled single item asks about change in health status over the previous year. For the 8 dimensions, scores are coded, summed, and transformed onto a scale from 0 (worst possible health status) to 100 (best possible health status). Standardized subscale and final global scores on the SF-36 range from zero to 100. The SF-36 has been validated in a Turkish population.¹⁹ Test-retest correlations of the 8 subscales ranged from 0.82 to 0.97. Chronbach alpha values for internal consistency of subscales ranged from 0.79 to 0.90.

Procedure

The MQOLS-CA2 was translated into Turkish following Brislin's steps in translation,²⁰ which included: (a) use of competent bilingual translators familiar with the content; (b) translation from the source language (English) to the target language (Turkish) by one translator, and backward translation from Turkish to the English by a second, independent translator; (c) examination by several raters of the original English, the Turkish, and back-translation versions for meaning errors; (d) resolution of all differences in meaning between the translation and back translation; (e) pretesting of the Turkish translation on a monolingual target language sample ($N = 30$); (f) revision

of both English and Turkish versions if the pretest showed problems in comprehension; and (g) administration of the revised English and Turkish versions to bilingual subjects ($N = 30$). Results of the paired t test demonstrated no significant differences between the English and Turkish versions of MQOLS-CA2 ($t = 0.14$, $P = 0.89$). In the pilot tests, the average time required to complete the questionnaire was 8.3 minutes. The SF-36 was translated into Turkish using the ethnographic translation method as described by Pinar.¹⁹

Approval for the study was obtained from the hospital review boards for the protection of human subjects in research. Before the study, the 72 participants provided written informed consent. Instruments were administered in a hospital's education room, a quiet, well lighted room that provided an atmosphere in which patients could concentrate on filling out the questionnaires without being disturbed. A third questionnaire was used to collect information on sociodemographic variables (eg, sex, age, education) and cancer-related variables (eg, type of cancer, metastasis, duration of cancer).

Afterwards, patients were asked to self-administer the MQOLS-CA2 and the SF-36. It was also suggested that patients could receive help to complete the questionnaires from a friend, a relative, or the researcher if necessary. Three people required some assistance from the researcher who simply read the items, did not change the questions or items, and did not provide any additional explanations. Instruments took an average of 17 minutes to complete (range = 14 to 40 minutes).

Validity for the Turkish version of the MQOLS-CA2 was established in 2 ways: construct validity and criterion (convergent) validity. Factor analysis was used for construct validity.²¹ Comparison of global scores from the Turkish MQOLS-CA2 with the Turkish SF-36 provided criterion validity. The SF-36 was chosen as the criterion because of its established validity and reliability in numerous studies, languages, and disease groups, including cancer patients; and because of the availability of norms from a number of populations.^{19,22-24}

Reliability of the MQOLS-CA2 was based on internal consistency (Cronbach alpha coefficient)²⁵ and test-retest stability (Pearson's correlation coefficient).²⁶ The test-retest approach was favored for the MQOLS-CA2 as it fitted easily into the study programme, and was appropriate for a self-report questionnaire. The retest occurred 2 weeks following the first test of the MQOLS-CA2. Two weeks was judged to be the optimum retest interval because it was sufficiently long for patients to forget their initial responses to the 33 items, but not so long that most QOL domains would change substantially. The response rate was 100%. A statistician performed statistical analysis with the Statistical Package for the Social Sciences (SPSS) and significance for all statistical tests was set at the $P = .05$ level.

■ Results

General Characteristics of the Sample

General characteristics of the sample are given in Table 1. The mean age of participants was 48 ± 15.5 years (SD). The majority

❁ **Table 1 • General Characteristics of the Sample**

	Number	%
Sex		
Female	31	43.1
Male	41	56.9
Age (mean \pm SD), y	48 ± 15.5	(range: 18–72 y)
Marital status		
Single	8	11.1
Married	60	83.3
Divorced/widowed/separated	4	5.6
Educational status		
Illiterate (no formal education)	12	16.7
Primary school (5 y education)	2	2.7
Secondary school (8 y education)	40	55.6
High School (11–12 y education)	12	16.7
University	6	8.3
Income		
Low	34	47.2
Middle	38	52.8
Type of cancer		
Lung	19	26.4
Colon	15	20.8
Breast	7	9.7
Gynecological cancers	5	6.9
Others	26	36.1
Disease duration (mean \pm SD), mo	10.91 ± 14.09	(range: 2–96 mo)
Type of treatment		
Chemotherapy	20	27.8
Combined treatment	52	72.2
Metastasis		
Present	22	30.6
Absent	50	69.4

of participants were men (56.9%), married (83.3%), had secondary school or less education level (75%), and described their income as "middle" (52.8%). The sample represented many different types of cancer, the most prevalent being lung and colon. The mean duration of cancer was 10.91 months. At the time of the study, more than half (72.2%) of the patients were currently receiving combined treatment including chemotherapy, radiation therapy, and surgical intervention. Twenty-two patients (30.6%) had metastasis.

Validity

The MQOLS-CA2's acceptability rate was excellent (96%) and there were no missing data. In all, 72 patients completed the MQOLS-CA2 in 5 to 30 minutes, with 78% completing the questionnaire in 10 minutes or less.

The MQOLS-CA2 showed satisfactory validity. Factor analysis confirmed the presence of 5 factors in the MQOLS-CA2:

PSY (factor 1 = 12 items), PHY (factor 2 = 7 items), NUT (factor 3 = 4 items), SYM (factor 4 = 5 items), and INT (factor 5 = 5 items). Eigenvalue were 11.83, 4.28, 3.10, 2.16, and 1.66 respectively. Factor 1 was the strongest accounting for the majority of the variance (32.5%). All items had strong loadings of ≥ 0.63 across all of the subscales of the MQOLS-CA2 (see Table 2). A Pearson correlation of $r = 0.78$, $P = 0.0001$ between the global scores of the MQOLS-CA2 and SF-36 support the criterion validity of the MQOLS-CA2.

Reliability

Stability was acceptable for the Turkish version of the MQOLS-CA2 with Pearson correlation coefficients for test-retest scores ranging from 0.56 (SYM) to 0.91 (PHY) for the 5 subscales (Table 3). Chronbach alpha coefficients for the 5 subscales of the MQOLS-CA2 ranged between 0.76 and 0.92 supporting the internal consistency of the subscales (Table 3).

Discussion

The Turkish version of MQOLS-CA2 underwent rigorous psychometric testing using an acceptable sample size. Construct validity, criterion validity, test-retest reliability, and internal consistency of the translated instrument were clearly demonstrated.

Validity

The results of this study indicate that the MQOLS-CA2 is a relatively brief and well-accepted instrument that is appropriate for use in studies with Turkish cancer patients. The MQOLS-CA2's acceptability rate was excellent, there were no missing data, and all the patients completed the questionnaire in a timely manner, which indicates that the instrument did not pose a burden.

In this study, the Turkish version of the MQOLS-CA2 had acceptable construct and criterion validity. Results of the factor analysis showed that items grouped together in expected factors, confirming the presence of 5 factors for the MQOLS-CA2 (Table 2). The analysis confirmed the importance of psychological well-being as a primary dimension of QOL. The items that provide the strongest association with the psychological well-being factor of the MQOLS-CA2 were adjusting to disease or treatment, enjoying life, worry about financial security, feeling useful, feeling happy, satisfying life, worry about disease, able to concentrate, having a good (general) QOL, satisfying appearance, worry about unfinished business, and meaningful life. Factor loadings also validated the relevance of general physical well-being as the second most important dimension in the MQOLS-CA2 content domain. The items that stand out as descriptors of this dimension included present health state, able to do things I like to do (ie, watch TV, read), strength, tiring easily (ie, fatigue), able to sleep/getting sufficient sleep, able to work/carry out usual tasks (ie, dressing, combing hair, using toilet), and able to get around as desired. The third important dimension in the MQOLS-CA2

content domain was identified as nutrition. It was defined by 4 items: appetite, able to eat, worry about weight, and taste changes. The items belonging to the fourth dimension of the MQOLS-CA2 content domain, symptom distress, were pain distress, pain amount, bowel movements, nausea, and vomiting. The items in the last dimension, interpersonal well-being, included love from others, disease/treatment interfering with relationships, able to fulfill responsibilities, receive emotional support and make others happy.

Previous versions of the MQOLS-CA2 (ie, QLI/MQOLS) included some different items depending on the specific cancer population studied, and were used in 6 studies.¹³⁻¹⁸ These studies also showed that the psychological well-being factor had the largest eigen value accounting for the greatest part of the variance in the factor structures of the instruments, similar to present results. In the older studies,¹³⁻¹⁸ the items that provided the most consistent construct validity for the psychological well-being subscale of the QLI/MQOLS were satisfying life, having a good (general) QOL, meaningful life, and feeling happy. Enjoying life had a strong loading of 0.70 on psychological well-being. In our study, the items most strongly associated with the psychological well-being factor were: able to concentrate, worry about disease, feeling happy, worry about unfinished business, and meaningful life. The older studies also validated the relevance of general physical well-being as the second most important dimension in the health-related QLI/MQOLS content domain based on factor analyses. The items that stand out as descriptors of this dimension included tiring easily (ie, fatigue), able to work/carry out usual tasks, and strength. In the older studies, the symptoms/side effects factor usually occupied the third or fourth position in the factor structure. Consistent descriptors of this factor included nausea, vomiting, pain amount, and pain distress. These results were likewise consistent with our study's findings. The nutrition factor was apparent in 4 of the 6 studies. In one study with cancer patients, the items "able to eat" and "appetite" emerged with the physical well-being factor.¹⁷ In a study that was conducted in patients with cancers in the pelvic region, the same 2 items were found under psychological well-being.¹⁶ "Able to eat" and "appetite" also appeared under psychological well-being in patients with a colostomy.¹⁵ Finally, inconsistent representation of interpersonal well-being items was found across the 6 versions of the QLI. In our study, all 5 subscales were similar to the MQOLS-CA2's original factor construct.¹⁶

The present study revealed that factor loadings on all MQOLS-CA2 factors were equal to or greater than 0.63; thus, satisfying the criteria that predictive items have loadings ≥ 0.45 .²¹ These results indicate that all items were strongly related to their factors. Furthermore, a factor is considered relevant if its eigen value (a statistical measure of its power to explain variation between subjects) exceeds 1.1.²¹ In the present study, eigen values ranged from 1.60 to 11.80, thus satisfying this expectation.

In this study, criterion validity was evaluated by comparing the MQOLS-CA2 total score and SF-36 total score. As expected, the correlation between the 2 scores was significant. This finding suggests that the 2 scales assess the same issues and measure similar attributes.

Table 2 • Factor Construct of the MQOLS-CA2 (N = 72)*

Item No	F1	Item No	F2	Item No	F3	Item No	F4	Item No	F5
PSY2 (adjusting to disease or treatment)	0.79	PHY1 (present health status)	0.78	NUT20 (appetite)	0.78	SYM5 (pain distress)	0.69	INT9 (love from others)	0.64
PSY3 (enjoying life)	0.76	PHY12 (able to do thing I like to do)	0.68	NUT22 (able to eat)	0.77	SYM19 (pain amount)	0.89	INT10 (interference with relation)	0.63
PSY4 (worry about financial security)	0.66	PHY14 (strength)	0.88	NUT23 (worry about weight changes)	0.75	SYM21 (bowel movements)	0.72	INT30 (able to fulfill responsibilities)	0.63
PSY6 (feeling useful)	0.78	PHY15 (tire easily)	0.86	NUT26 (taste changes)	0.76	SYM24 (nausea)	0.76	INT32 (receive emotional support)	0.77
PSY7 (feeling happy)	0.87	PHY16 (able to sleep)	0.63			SYM25 (vomit)	0.77	INT33 (make others happy)	0.69
PSY8 (satisfying life)	0.78	PHY18 (able to work)	0.69						
PSY11 (worry about disease)	0.89	PHY27 (able to get around as desired)	0.74						
PSY13 (able to concentrate)	0.92								
PSY17 (having a good QOL)	0.73								
PSY28 (satisfying appearance)	0.68								
PSY29 (worry about unfinished business)	0.83								
PSY31 (meaningful life)	0.82								
Eigen value	11.83		4.28		3.10		2.16		1.66
Percent (%) observed variance	32.5		11.8		8.6		6.0		4.6

*QOL indicates quality of life; PSY, psychological well-being; PHY, physical well-being (general); NUT, nutrition; SYM, symptom distress; INT, interpersonal well-being.

Table 3 • Reliability of the MQOLS-CA2 (N = 72)

Scale	Test-Retest Reliability*	Internal Consistency (Chronbach α)*
Psychological well-being	0.77	0.92
General physical well-being	0.91	0.78
Nutrition	0.67	0.82
Symptom distress	0.56	0.76
Interpersonal well-being	0.62	0.91

*All correlations are statistically significant at $P < .001$.

Reliability

The reliability assessment of the MQOLS-CA2 yielded highly satisfactory results. To our knowledge, test-retest reliability of the MQOLS-CA2 has not been assessed in patients with cancer. Although test-retest correlation values as low as $r = 0.21$ have been reported as evidence for reliability, $r > 0.5$ is a more realistic measure.²⁷ In this study, test-retest correlations of data collected 2 weeks apart support the stability of the 5 MQOLS-CA2 subscales (See Table 3).

In the present study, all 5 subscales of the MQOLS-CA2 yielded Chronbach alphas exceeding 0.70; thus, satisfying Nunnally's criterion for satisfactory internal consistency.²⁸ It is expected that well-developed and used instruments should have alpha values in excess of 0.80.²¹ In the present study, with the exception of an alpha of 0.78 for the PHY and 0.76 for the SYM, alpha values ranged from 0.82 to 0.92, thus partially satisfying the criterion for a well developed tool.²¹

Conclusion

The present study confirms the MQOLS-CA2 as an important addition to QOL measures available for use with cancer patients. These findings suggest that the Turkish version of the MQOLS-CA2 is a valid and reliable tool that could be employed in research on Turkish people with cancer.

ACKNOWLEDGMENT

The author expresses her warmest thanks to Professor Geraldine Padilla for valuable advice during the preparation of the manuscript.

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