

Validity and Reliability of the Turkish Version of the COVID-19-Impact on Quality of Life Scale

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Abstract

The objective of this study was to adapt the COVID-19-Impact on Quality of Life (COV19-QoL) scale for Turkish individuals and to determine its validity and reliability.

Materials and Methods. This methodological study was conducted between December 25, 2020 and January 10, 2021. The research was conducted online and included 485 participants who completed a socio-demographic questionnaire, the COV19-QoL scale and the Duke Health Profile (DUKE) on Google Forms. Back translation was used for the Turkish version of the COV19-QoL scale. Language and content validity of the scale were found to be acceptable.

Results. Ten experts were consulted regarding content validity of the scale. The results, item content validity of 0.95 and scale content validity of 0.95, indicated excellent content validity. Explanatory factor analysis found one principal structure with a total variance of 59.449%. The Cronbach's alpha internal consistency coefficient was 0.86 for the scale. A statistically significant moderate negative correlation was found between the participants' COV19-QoL scale score and their general health score on the DUKE ($r = -0.384$; $p < 0.01$).

Conclusions. This study found that the Turkish version of the COV19-QoL scale is a valid and reliable instrument for assessing the effects of the COVID-19 pandemic on the Turkish population's quality of life.

Keywords

Cov19-Qol Scale; Quality of Life; Validity; Reliability

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Introduction

The coronavirus disease (COVID-19) was first witnessed in Wuhan, China, in December 2019 and rapidly spread throughout the world, resulting in a pandemic. Significant global challenges in relation to the environment, economy, health, and social life have resulted [1]. The restrictive measures employed to prevent the spread of the virus had a negative effect on social interactions and people's daily lives. Furthermore, the pandemic posed a considerable threat to public health and had an adverse effect on individuals' quality of life (QoL) because of unprecedented personal and social fear and anxiety [2].

Sim and Chua noted that previous global pandemics affected not only individuals' physical health, but also their mental health and QoL [3]. Moreover, regardless of health and vulnerability, the entire population was affected [4]. According to the research, social isolation during the COVID-19 pandemic results in individuals engaging in fewer social activities. This, in turn, exacerbates an increase in chronic diseases and current health problems,

which has a negative effect on QoL and mental health, thus leading to anxiety and depression [5, 6].

Nguyen and Vu found that individuals who were suspected of having COVID-19 symptoms were more likely to experience depression and a lower health-related QoL in comparison to those with no symptoms [7]. Liu *et al.* revealed that anxiety and depression rates increased during the pandemic [8]. During the COVID-19 pandemic, 16.5% of participants in a study experienced moderate to severe depression symptoms and 28.8% of individuals under study experienced moderate to severe anxiety symptoms [8–10].

The World Health Organization defines QoL as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns [11]. QoL is related to continuous individuals' development and changes and is affected by social, economic, and cultural values. Peel, Bartlett and Marshall have stated that individuals who enjoy life, do not suffer from diseases and enjoy active social lives have good QoL [12]. However, pandemics have an adverse effect on

individuals' QoL. The most optimal way to study QoL is to employ context-specific assessment tools. The Coronavirus Anxiety Scale (CAS) and the Fear of COVID-19 Scale (FCV-19S) were developed during the COVID-19 pandemic [13, 14]. However, the COVID-19-Impact on Quality of Life (COV19-QoL) scale is the only scale to assess the effects of the COVID-19 pandemic on QoL. In addition, there is only one scale adapted for the Turkish population and evaluating the impact of the COVID-19 pandemic on QoL and in this scale, "criterion validity" is not emphasized [15].

The objective of this study was to adapt the COV19-QoL scale for the Turkish population and to examine the validity and reliability of the Turkish version of the scale.

Materials and Methods

Design and Participants

This methodological study was conducted between December 25, 2020 and January 10, 2021. The literature recommends that sample sizes should be three to ten times more than the number of items on scales in scale adaptation studies [16, 17]. The COnsensus-based Standards for the selection of health status Measurement INstruments (COSMIN) checklist recommends there should be at least 100 participants and seven times the number of items [18].

A socio-demographic questionnaire, the Duke Health Profile (DUKE) and COV19-QoL scale were employed to collect data online using Google Forms. Initially, the survey link was sent to individuals in the researcher's close circle who met the inclusion criteria. Subsequently, the survey link was sent to the participants via email or social media addresses, and they were encouraged to forward the survey to as many people as possible. Upon clicking the link, potential participants were provided with information about the study, as well as an informed consent form. Upon agreeing to participate in the study, participants completed one questionnaire and two scales. Individuals who were 18 years old or older, could read and understand Turkish and provided informed consent voluntarily were included in the study.

Instruments

The Socio-Demographic Questionnaire

The researcher prepared a 14-item socio-demographic questionnaire assessing participant's demographic characteristics in accordance with the literature [8, 19–21].

COVID-19-Impact on Quality of Life Scale

The COV19-QoL scale was developed by Repišti *et al.* in 2020 [21]. The COV19-QoL scale has six items assessing mental health-related QoL on a 5-point Likert-type scale: the first item evaluates participants' feelings about the impact of the current pandemic on their QoL in general; the second and third items are concerned with participants' perceptions of possible mental and physical health deterioration; the fourth and fifth items assess pandemic-related anxiety and depression levels; the sixth item evaluates the extent to which participants perceive that their personal

safety is at risk. The Cronbach's alpha internal consistency coefficient was 0.88 for the general population [21].

Duke Health Profile

A short version of the DUKE, which assesses QoL, was developed by Parkerson, Broadhead and Tse in 1990 [22]. The short version of the DUKE includes 17 items to facilitate its use. Kuzu *et al.* confirmed the validity and reliability of the scale [23]. The 17-item DUKE has 11 subscales assessing six functional and five dysfunctional health areas. Higher scores on the functional health areas indicate higher QoL, while higher scores on the dysfunctional health areas indicate lower QoL. The health status scores for both the functional and dysfunctional health areas range from 0 to 100 [22, 23]. For physical health, mental health, social health, general health, self-esteem, and perceived health, 100 indicates the best health status, and 0 indicates the worst health status. For anxiety, depression, anxiety-depression, pain, and disability, 100 indicates the worst health status and 0 indicates the best health status.

Analysis of Psycholinguistic Features (Language Validity)

The COV19-QoL scale was translated into Turkish by two native English speakers. Subsequently, a translator who was fluent in both Turkish and English but had no knowledge of the English version of the scale re-translated the Turkish version back into English. Thereafter, ten bilingual specialists who were not included in the study compared this version to the original COV19-QoL scale. They chose the most appropriate translation for each item or provided alternative translations to improve the items and determine the cultural compatibility of the scale. Finally, a pilot test of the scale was conducted with ten participants. Language and content validity of the scale were found to be acceptable. The results of the pilot test revealed that the questions were understandable and, therefore, not subject to revision.

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) for Windows, Version 22.0 was employed for data analysis. The socio-demographic data comprised numbers and percentages. Back translation was employed to assess language validity. Specialists assessed content validity; the mean lower-upper group scores (t-test) were employed to assess criterion validity; explanatory and confirmatory factor analyses were conducted to analyse construct validity. Furthermore, the Cronbach's alpha coefficient and Pearson's product-moment correlation coefficient were employed to determine internal consistency and analyse the items, respectively.

Results

The sample included 485 individuals. The mean age of the participants was 31.36 ± 10.89 years. There were 69.1% of females, 51.8% of single subjects, 67% of participants with a university degree. The income of 56.5% of people under study was equal to their expenses. In addition,

Table 1. Demographic characteristics of the study sample (N = 485).

Characteristics	N (%)
Gender	
Female	335 (69.1)
Male	150 (30.9)
Age (mean ± SD)*	31.36 ± 10.89
Marital status	
Married	234 (48.2)
Single	251 (51.8)
Education level	
Primary school	51 (10.5)
Secondary school	88 (18.1)
Undergraduate	325 (67.0)
Graduate or higher education	21 (4.3)
Income status	
Income less than expenses	129 (26.6)
Income equal to expenses	274 (56.5)
Income greater than expenses	82 (16.9)
Residence	
City	351 (72.4)
District	108 (22.3)
Village	26 (5.4)
Receiving support	
Living alone	43 (8.9)
Living with family	428 (88.2)
Living with caregiver	14 (2.9)
Frequency of contact with others during the pandemic	
Less	466 (96.1)
Same	17 (3.5)
More	2 (0.4)
Behavioural change	
Yes	441 (90.9)
No	2 (0.4)
Partial	42 (8.7)

Note: * data are expressed as mean ± SD (standard deviation).

72.4% of subjects resided in a city, 88.2% of participants lived with their families, 96.1% of individuals had little contact with others during the pandemic, and 90.9% of subjects experienced behavioural changes (Table 1).

Content Validity

Ten specialists were asked to rate each item on a scale, ranging from one to four, to assess content validity of the scale and subsequently provide recommendations. Thereafter, item content validity (I-CVI) and scale content validity (S-CVI) were calculated to determine content validity of the scale. The results revealed that I-CVI was 0.95 and S-CVI was 0.95, thus indicating excellent content validity. All the original scale items were retained for factor analysis.

Construct Validity

The data set was found to be suitable for explanatory factor analysis as the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO-MSA) was 0.869, which was higher than the recommended value of 0.60 [17]. The Bartlett's test of Sphericity found an χ^2 value of 1267.119 ($p < 0.001$), thus indicating that the scale items were related to each other. The Kaiser criterion and scree plot analysis gener-

ated one principal component with an eigenvalue of 3.567 and accounted for 59.449% of the total variance (Table 2). The factor loadings and communalities are presented in Table 2.

The Chi-square/degree of freedom of the COV19-QoL scale was 4.66 ($\chi^2/df < 5$) and its $p < 0.01$. Both these values indicated a good fit [24]. The root mean square error of approximation (RMSEA) value was 0.08, the goodness-of-fit index (GFI) value was 0.97, the adjusted goodness-of-fit index (AGFI) value was 0.93, while the comparative fit index (CFI) value was 0.97, and the normed fit index (NFI) value was 0.96 (Fig. 1). For goodness-of-fit indices, 0.90-0.95 is acceptable and a value above 0.95 indicates a good fit. These values indicate a good fit [24–26].

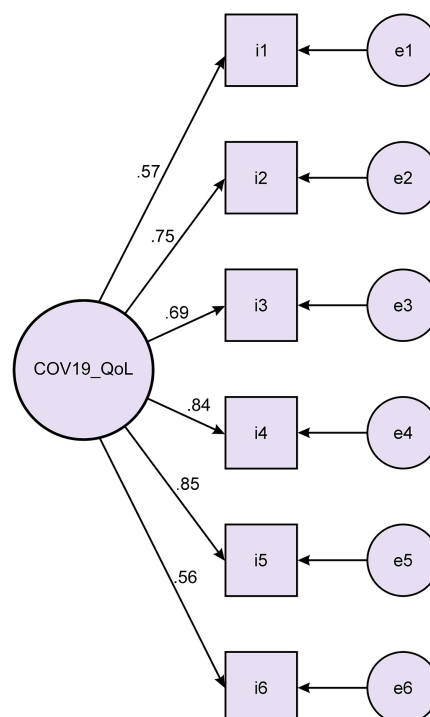


Figure 1. Path diagram for the COV19-QoL scale.

Internal Consistency

The Cronbach's alpha coefficient for the COV19-QoL scale was 0.86, being above the acceptable internal consistency reliability of 0.70. The Turkish version of the scale met the acceptable standards of internal consistency as well. The results of item analysis, namely the corrected item-total correlation, squared multiple correlation and alpha coefficient with deleted items are presented in Table 3. All the corrected item-total correlation coefficients were above 0.5, with item 4 having the highest value (0.752). All the mutual correlations of the scale were found to be moderate to high, positive, and statistically significant ($p < 0.01$), thus indicating all the items should be part of the scale (Table 4). The mean inter-item correlation was 0.508. Repišti *et al.* (2020) found this value to be 0.561 [21]. According to Clark and Watson (1995), this value should ideally be between 0.20 and 0.50 [27]. An equal or a slightly

Table 2. Factor loadings of principal component analysis for the COV19-QoL scale.

Items	Factor Loadings	Communalities
4. I feel more tense than before	0.844	0.712
5. I feel more depressed than before	0.849	0.721
2. I think my mental health has deteriorated	0.748	0.560
3. I think my physical health may deteriorate	0.691	0.478
1. I think my quality of life is lower than before	0.571	0.327
6. I feel that my personal safety is at risk	0.561	0.315
Eigenvalue	3.567	
Variance explained (%)	59.449	

Table 3. Results of checking the COV19-QoL scale for internal consistency.

Due to the Spread of the Coronavirus	Mean±SD	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1. I think my quality of life is lower than before	4.11 ± 1.17	0.542	0.303	0.856
2. I think my mental health has deteriorated	3.65 ± 1.26	0.693	0.508	0.830
3. I think my physical health may deteriorate	3.63 ± 1.23	0.657	0.446	0.837
4. I feel more tense than before	3.90 ± 1.24	0.752	0.621	0.819
5. I feel more depressed than before	3.66 ± 1.32	0.743	0.627	0.820
6. I feel that my personal safety is at risk	3.47 ± 1.33	0.538	0.294	0.859
COV19-QoL (total scale)	3.74 ± 0.97	Cronbach's alpha = 0.861		

Table 4. Intercorrelations of the COV19-QoL scale items.

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Item 1	-	0.438	0.404	0.499	0.444	0.377
Item 2	0.438	-	0.590	0.596	0.637	0.412
Item 3	0.404	0.590	-	0.551	0.559	0.446
Item 4	0.499	0.596	0.551	-	0.748	0.464
Item 5	0.444	0.637	0.559	0.748	-	0.450
Item 6	0.377	0.412	0.446	0.464	0.450	-

Note: all correlations are significant, $p < 0.01$.

greater value of the mean inter-item correlation compared to the upper bound of this interval indicates a high homogeneity of the scale [21, 27].

In relation to item analysis based on the mean lower-upper group scores, 27% of the top of the scale score distribution and 27% of the bottom of the scale distribution were determined to be the upper and lower groups, respectively. A statistically significant difference was found between the mean item scores of the lower and upper groups in the Turkish version of the COV19-QoL scale ($t = -42.93$, $p < 0.001$).

Criterion Validity of the COV19-QoL scale

Concurrent validity, which is assessed with the correlation coefficient obtained after a valid assessment instrument and a new assessment instrument are administered to a sample, [28] was employed to evaluate criterion validity of the COV19-QoL scale. The mutual correlations of the COV19-QoL scale and the general health score on the DUKE were analysed to determine concurrent validity. An increase in the DUKE score has been stated to indicate a better QoL, while an increase in the COV19-QoL scale score has been stated to indicate a worse QoL [21, 23]. A statistically significant moderate negative correlation was

found between the participants' COV19-QoL scale scores and their general health scores on the DUKE ($r = -0.384$; $p < 0.01$).

Discussion

In this study, the psychometric properties of the Turkish version of the COV19-QoL scale were examined and compared to those of the DUKE, which is a general QoL scale. The results revealed that the Turkish version of the COV19-QoL scale had acceptable properties for assessing perceptions of QoL during the COVID-19 pandemic. Although there are many scales that evaluate the psychosocial status of individuals in the context of the COVID-19 pandemic, there are very few scales that focus on QoL [29–32]. In addition, this is the first study validated with a scale that measures overall QoL (another valid measurement tool, the DUKE). The adaptation of the COV19-QoL scale to Turkish was done under the guidance of the COSMIN [18].

The COSMIN checklist emphasises that item appropriateness should be determined for back translation during the translation process, back translation should be performed independently by two translators and a pilot study should be conducted [18]. Accordingly, while developing the Turkish version of the COV19-QoL scale, back trans-

lation was performed. The translators considered natural differences in the structures of the English and Turkish languages that required a change in some of the items beyond translation. Furthermore, cultural and environmental features are recommended to be considered for the intercultural adaptation of instruments in addition to translation. Therefore, the authors considered these approaches in such a way to strengthen the integrity of the translation and realize cultural and functional equivalence.

The DUKE was employed to determine criterion validity of the COVID-19-QoL scale. Kuzu *et al.* confirmed the validity and reliability of the DUKE [23]. The DUKE was employed as no other scales were utilised to assess QoL during the pandemic in Turkey. The results revealed a significant moderate negative correlation ($r = 0.38$) between the Turkish version of the COVID-19-QoL scale and the general health score on the DUKE. Unlike the original study, its correlation with a general QoL scale (DUKE) was examined, and concurrent validity was confirmed. In addition, although different adaptation studies of the COVID-19-QoL scale have been carried out, concurrent validity has not been examined in these studies [15, 33].

The KMO-MSA value was 0.869, which was considered a good value and indicated that the scale had a high level of adequacy to assess the intended condition, as well as an adequate sample size to perform factor analysis. The Bartlett's test of Sphericity found the p -value to be 0.00, which demonstrated that scale items were related to each other and effective to assess the intended condition. Factor analysis revealed that, similar to the original scale, the structure of the scale had one dimension and demonstrated the scale accounted for 59.449% of the total variance [21]. The COSMIN checklist recommends that confirmatory factor analysis (CFA) should be conducted to ensure structural validity and the information on how this analysis is conducted should be explicit. Accordingly, CFA was performed to assess the fit indices of the model. The COVID-19-QoL scale's Chi-square/degree of freedom and p -values were compatible with the good fit value ($\chi^2/df = 4.66$, $p < 0.01$). The RMSEA, NFI, CFI, GFI and AGFI values were 0.08, 0.96, 0.97, 0.97 and 0.93, respectively. These values indicate that the model is compatible and has structural validity.

The COSMIN checklist recommends that the Cronbach's alpha coefficient should be calculated to assess internal consistency. The Cronbach's alpha coefficient was 0.86 for the COVID-19-QoL scale, thus indicating good internal consistency. It is noteworthy that the Cronbach's alpha coefficient for the original scale for the general population was 0.88 [21]. Furthermore, all the corrected item-total correlations were above 0.30. All the mutual correlations of the COVID-19-QoL scale were moderate to high, positive, and statistically significant ($p < 0.01$), thus demonstrating that all the items could be included in the scale [34]. The results have revealed that the Turkish version of the COVID-19-QoL scale has excellent internal consistency and is a valid and reliable instrument for assessing the effects of the COVID-19 pandemic on QoL.

The findings revealed that the pandemic had the most

considerable effect on QoL in general and the least impact on safety. The restrictions implemented had an adverse effect on individuals' QoL. These findings concur with those of Repišti *et al.* [21].

Limitations

This study is limited in that the sample may not have represented the general population as it was limited to participants with access to the Internet and social media. Furthermore, those who agreed to participate in the survey may have felt they were more adversely affected by the pandemic than those who did not participate. Therefore, the generalizability of its results may be limited.

Conclusions

This study found, based on validity and reliability analyses, that the Turkish version of the COVID-19-QoL scale is compatible with the structure of the original scale, has six items and one-dimensional structure and is a valid and reliable instrument. One may conclude that the Turkish version of the COVID-19-QoL scale is a valid and reliable instrument for assessing the effects of the COVID-19 pandemic on QoL among the general population.

Ethical Statement & Informed Consent

The principles of the Declaration of Helsinki were followed throughout the study. The COVID-19-QoL scale was translated into Turkish and used after the necessary permission from Selman Repišti, who developed the scale, was obtained. Approval to conduct the study was obtained from the Kutahya Health Sciences University Non-invasive Clinic Research Ethics Committee (decision number 2020/18-19, 12.22.2020). Furthermore, participants gave their informed consent before participating in the study.

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Conflict of Interest

The authors declare no conflict of interest.

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