Development of an Attitude Scale for the Use of Telemedicine Services

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Abstract

Introduction: *This study aimed to develop a scale to assess attitudes toward the use of telemedicine services, to study the reliability and validity of the developed scale, and to determine the characteristics that may be associated with the scores obtained from the scale.*

Methods: *This study, which was conducted with 600 people older than 18 years, who applied to Family Health Centers in Meram district of Konya province, was designed in a methodological type. The sociodemographic characteristics form and the candidate scale form designed in a 5-point Likert structure were used to collect data in the study. The data collection forms were applied to the participants under observation. SPSS and R programs were used for data analysis. Statistically, cases with* $p < 0.05$ *were considered significant.*

Results: *Two hundred fifty people (*$n = 250$*) for reliability and explanatory factor analysis and 350 people for confirmatory factor analysis, 600 people in total, were included in the study. The results of all reliability and validity analyses of the candidate scale were found to be sufficient. The explained variance of the one-dimensional 18-item scale was 53.8% and the Cronbach's alpha coefficient was 0.947. There was a significant difference between the score obtained from the scale and work status and presence of chronic disease (*$p < 0.05$*).*

Conclusion: *As a result of the research, a new measurement tool called "Attitude Scale Towards the Use of Telemedicine Services" consisting of 18 questions was developed, reliability and validity analyses were performed, and it was shown that it is suitable for use in individuals older than 18 years.*

Keywords: *reliability and validity, scale, scale development, attitude, telemedicine services*

Introduction

The World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. Access to the highest attainable standard of health care is one of the fundamental rights of every human being, regardless of race, religion, political belief, and economic or social status.[1] One of the greatest challenges facing humanity in the 21st century is to make quality health care accessible to all.[2] To provide this access, health services must evolve over time and be organized in a way that is compatible with the economic situation of the country.[3]

The WHO defines telemedicine as "the delivery of health services by health professionals using information and communication technologies to improve the health of individuals and communities through diagnosis, treatment, prevention, research, evaluation, and continuing education of health professionals when distance is a factor."[4] WHO emphasizes that the main objectives of telemedicine are to provide clinical support, connect people who are not in the same place, overcome geographical barriers, and improve health outcomes.[5]

Attitude is a state of emotional and mental readiness that is formed as a result of life and experience and has a directive or dynamic effect on the individual's behavior toward the object and situations to which it is related.[6] It is important to study

attitudes because it is thought that attitudes influence the behavior that emerges and guide behavior. Knowing the attitudes will make it possible to know many related behaviors. That is why it is important to measure attitudes. Knowing whether the attitudes are positive or negative will enable the necessary measures to be taken in practice, because having information about people's attitudes will enable their behavior to be predicted and controlled in advance.[7]

When the national and international literature is examined, there are some studies in which remote health services can be evaluated by patients. These studies use patient satisfaction surveys and telemedicine satisfaction surveys.[8,9] However, there is no scale in the literature to measure the general attitudes toward remote health services. It is important for researchers to be able to evaluate the general attitude of the society toward remote health services using a standard scale. By measuring the said attitude correctly, effective interventions can be planned for groups with both positive and negative attitudes and the rate of use of remote health services can be increased.

The aims of this study are to develop a scale that can be used to measure attitudes toward the use of telemedicine services, to carry out reliability and validity analyses of the pilot application of the developed scale and to determine some characteristics that may be related to the score obtained from the Attitude Scale toward the Use of Telemedicine Services. There is no standard measurement tool in the literature to assess attitudes toward the use of this service. Therefore, our study is original and will contribute to the literature.

Methods

The study is a methodologically designed scale development, validity and reliability study. The study was approved by the Ethics Committee of Necmettin Erbakan University Meram Faculty of Medicine (No.: 2022/4023; Date: October 21, 2022). During data collection, participants were given detailed information about the study and data collection forms to be used in the study, and those who gave verbal consent were included in the study. The research was conducted in 29 family health centers in Meram, the central district of Konya.

A field study (pilot implementation and reliability and validity study) was conducted between November and December 2022 to collect data related to the study. Patients older than 18 years and their relatives who gave verbal consent to participate in the study and those with the lowest level of education were included in the study. Descriptive statistical analyses of data collected were carried out periodically, and attempts were made to equalize the distributions in terms of age group, gender, and educational level, so that the measurement tool developed could be used safely in the entire population 18 years of age and older.

In scale development and adaptation studies, the sample size can be calculated according to the number of items in the scale and the content of analyses to be made. It is generally accepted that the sample size should be at least 5–10 times the number of items. In factor analysis, it is stated that working with at least 300 people reduces problems in the analysis.[10–13] Furthermore, it is stated that Explanatory Factor Analysis (EFA) should not be performed on the same sample and the same data.[14] For these reasons, the reliability analysis and EFA of the candidate scale consisting of 20 items were performed on a group of 250 people, the confirmatory factor analysis (CFA) was performed on another group of 350 people, and the reliability and validity analysis of the candidate scale was performed on a total of 600 people.

The data collection form used in the research was created after the literature review. The data collection form consists of 17 questions and 2 parts. In the first part, there are nine questions about the sociodemographic characteristics of people, and in the second part, there are eight questions about the characteristics of people regarding the use of health services. Following the data collection form, there is a candidate scale form consisting of 20 questions, which is finalized after face validity, content validity, and pilot application in the field. The Candidate Scale Form was designed in a one-dimensional and five-point Likert structure, to be answered in the range of "5: Strongly Agree, 4: Agree, 3: Undecided, 2: Disagree, and 1: Strongly Disagree." The development stages of the scale are shown in *Figure 1*.

STATISTICAL ANALYSIS

Analysis of data obtained after fieldwork was performed using IBM SPSS Statistics, version 27.0 (IBM Corp, Armonk, NY, USA), and R (version 4.1.3) statistical package programs. Frequency distributions (*n*) and percentages (%) were used to summarize categorical data; mean ± standard deviation and median (Q1–Q3) values were used to evaluate numerical data. In the reliability study of the candidate scale, item-score-score correlation coefficient, Cronbach's alpha coefficient, item-total score correlation coefficient, item discrimination analysis, and two-half reliability analyses were performed. The cutoff value for item score-scale score correlation coefficient and item-total score correlation coefficient in item analysis was accepted as 0.200.[7,15] Cronbach's alpha, Spearman-Brown, and Guttman split-half coefficients above 0.70 were considered significant.[16–18] Cases where the Kaiser-Meyer-

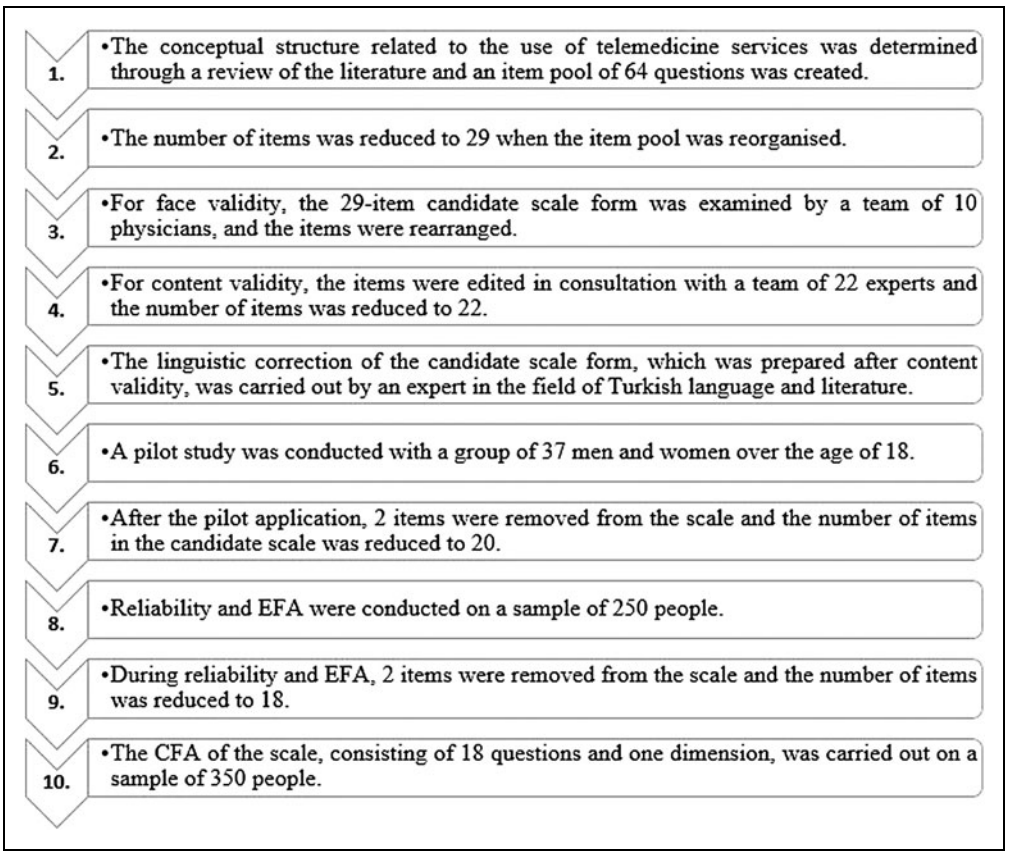

Fig. 1. Stages in the development of the scale.

Olkin (KMO) coefficient, which was used to assess the adequacy of sample size in EFA, was >0.70 were considered significant.[19]

In addition, cases where the *p*-value in the chi-squared statistic was used for Bartlett's sphericity test, which evaluated the suitability of the dataset for factor analysis was <0.05, were considered significant.[12,16,20–22] The factor load limit was 0.45.[15] After the reliability and validity study of the scale, the comparison of scores obtained from the scale with some characteristics of participants was done with the Independent Groups *T*-test and Pearson correlation in cases where the normality criterion was met. In cases where the normality criterion was not met, the Mann–Whitney *U* test, the Kruskal–Wallis H test, and the Spearman correlation test were used. Cases with $p < 0.05$ were accepted as statistically significant.

Results

SOCIODEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

The mean age of all participants was 40.35 ± 12.29 years. Fifty percent of the participants were women, 72.8% were married, and 43.3% were university graduates. It was found that 58.2% of the 600 people included in the study were actively working and 35.2% had chronic diseases. It was found that 11.2% ($n = 67$) of the research group were disabled and/or needed care at home. When participants had a health problem, 47.5% ($n = 285$) of them went to family health centers first. Forty five percent ($n = 270$) of the participants reported that they had visited their GP within the last month and 52.0% ($n = 312$) had visited a hospital within the last month.

RELIABILITY ANALYSIS OF THE CANDIDATE SCALE

Reliability analysis of the 20-item candidate scale was carried out on 250 people included in the study for reliability and EFA. In the first item analysis of the candidate scale, it was found that the item-score correlation coefficient of item 13 and item 18 was <0.200, and these two items were removed from the scale. The Cronbach's alpha coefficient calculated for a total of 20 items was 0.935.

After removing items 13 and 18 from the candidate scale, the remaining 18 items were rearranged and the item analysis was repeated. As the item-score correlation for each item was >0.200, no further item was removed from the scale at this stage. With the removal of items 13 and 18, the Cronbach's alpha value increased from 0.935 to 0.947.

An item-total score correlation analysis was then carried out on the remaining 18 items. It was found that the item-total score correlation values of the 18 items in the candidate scale were statistically significant, and the correlation coefficient values were between 0.499 and 0.861. Item discrimination analysis was then carried out. As it was found that the 27% lower and upper values used to decide on item discrimination were significant for all items, no item was removed at this stage ($p < 0.01$). In the two-half reliability analysis of the candidate scale, the Spearman-Brown coefficient was calculated as 0.910 and the Guttman Split-Half coefficient as 0.910 (*Table 1*).

Table 1. Results of Item Reordering and Reliability Analysis After Removal of Two Items

FIRST NAME	NEW NAME	ITEM SCORE-SCALE SCORE CORRELATION	CRONBACH'S ALPHA VALUE OF THE SCALE WHEN THE RELATED ITEM IS REMOVED	CORRELATION BETWEEN ITEM AND TOTAL SCORE*
Item 1	Item 1	0.590	0.945	0.640
Item 2	Item 2	0.594	0.945	0.646
Item 3	Item 3	0.544	0.947	0.607
Item 4	Item 4	0.620	0.945	0.664
Item 5	Item 5	0.789	0.942	0.817
Item 6	Item 6	0.744	0.943	0.780
Item 7	Item 7	0.838	0.941	0.861
Item 8	Item 8	0.443	0.948	0.499
Item 9	Item 9	0.777	0.942	0.807
Item 10	Item 10	0.534	0.946	0.585
Item 11	Item 11	0.742	0.943	0.775
Item 12	Item 12	0.747	0.943	0.780
Item 14	Item 13	0.766	0.942	0.796
Item 15	Item 14	0.642	0.944	0.686
Item 16	Item 15	0.734	0.943	0.766
Item 17	Item 16	0.735	0.943	0.768
Item 19	Item 17	0.774	0.942	0.801
Item 20	Item 18	0.773	0.942	0.802

In the item discrimination analysis, statistical significance was found between the lower and upper groups for all 18 items ($p < 0.05$). Cronbach's alpha coefficient: 0.947. Spearman-Brown Split Half Coefficient: 0.910. Guttman Split-Half Coefficient: 0.910.

*$p < 0.05$.

CONSTRUCT VALIDITY OF THE CANDIDATE SCALE

EFA and CFA were conducted to determine the construct validity of the candidate scale.

EFA OF THE CANDIDATE SCALE

The EFA of the candidate scale was carried out on a group of 250 people older than 18 years. The KMO value for the study group was 0.944. Bartlett's test of sphericity showed significant results ($\chi^2 = 312.048$, $p < 0.001$).

This factor structure of the candidate scale, which was prepared as a single factor at the beginning of the study, was tested with EFA. If the eigenvalue and explained variance of the first factor in EFA are at least three to four times larger than the second factor, it can be accepted as an indicator that the scale is unidimensional.[9,10,15]

In this study, the eigenvalue of the first factor was 9,696 and the explained variance was 53,868%, while the eigenvalue of the second factor was 1,182 and the explained variance was 6,568%. There was an 8.2-fold difference between the eigenvalues of the first and second factors. Considering this difference and looking at the slope in the scree graph, it was determined that the scale had a one-dimensional structure and no rotation was applied. The slope graph showing eigenvalues of the factors is shown in *Figure 2*.

As a result of the EFA, the 18-item candidate scale was found to be clustered under a single factor, explaining 53.868% of the variance, with an eigenvalue of 9.696. As the factor load of each item was >0.45, no item was removed from the scale as a result of EFA (*Table 2*).

CFA OF THE CANDIDATE SCALE

The CFA of the candidate scale was carried out with a group of 350 people, different from the sample on which the reliability and EFA were carried out. As the adaptation criteria of the candidate scale did not reach the desired level in the first stage, a modification was made between item 1 and item 2. After the modification, the *z*-values of standardized coefficients of the CFA of the scale were found to be statistically significant at the 99% confidence level. The standardized loads, *z*-values, *p*-values of the *z*-values, and error values of the items are presented in *Table 3*.

From the fit indices examined after the modification, it was found that χ^2/SD was 3.88, root mean square error of approximation (RMSEA) value was 0.091, standardized root mean square residual (SRMR) value was 0.046, comparative fit index (CFI) value was 0.914, and non-normed fit index (TLI [NNFI]) value was 0.902. According to the fit indices, the scale was found to have an acceptable fit. The CFA fit indices of the candidate scale and the acceptable limits are presented in *Table 4*. The path

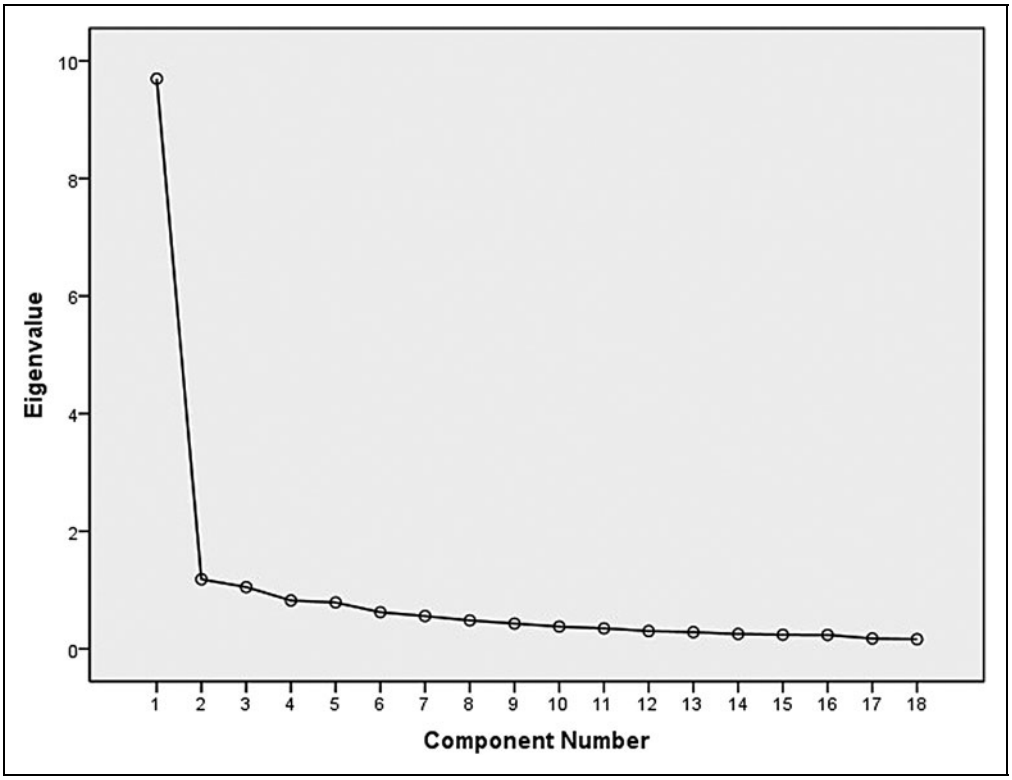

Fig. 2. Slope graph showing eigenvalues of the factors.

diagram of the verified factor structure of the candidate scale is shown in *Figure 3*.

VARIABLES THAT AFFECT THE SCALE SCORE

The mean score of the 18-item Attitude Scale for the Use of Telemedicine Services among the 600 participants enrolled in the study was 59.66 ± 14.39, and the median score was 61.00 (51.00–69.00). There was no statistically significant difference between the score obtained from the scale and the age, gender, marital status, education level, and income status of the individuals ($p > 0.05$). The total score of the scale was significantly higher in working individuals than in nonworking individuals, and in those with chronic diseases than in those without chronic diseases ($p < 0.05$). It was found that total scale scores were significantly higher among those who had a disabled and/or dependent person at home than among those who did not ($p = 0.008$). There was a difference between the institution they first applied to and the total scale score for health problems ($p = 0.009$).

The difference was due to the fact that the mean total score was higher for those who first went to a family health center than for those who first went to a public hospital. The mean score of individuals who reported that the family health centers where the family doctors were based were close to their homes was significantly higher than those who reported that they were not close ($p < 0.001$). There was a significant difference between the status of having visited a family health center or hospital in the last month and the total score on the scale ($p = 0.002$; $p = 0.007$, respectively) (*Table 5*).

Discussion

RELIABILITY AND VALIDITY OF THE ATTITUDE SCALE TOWARD THE USE OF TELEMEDICINE SERVICES

The reliability of the Attitude Scale toward the Use of Telemedicine Services was evaluated through a study conducted with a total of 250 people, 50% female and 50% male. Five different methods were used to evaluate the reliability of the scale: item analysis, Cronbach's alpha coefficient, item-total score correlation, item discrimination analysis, and two semireliability methods. In item analysis, the correlation coefficient is calculated between an item and the sum of the items other than that item. This process examines whether this item is compatible with the entire scale.[12] In item analysis, it is recommended to exclude items with negative sign-item-scale correlation coefficients and/or items close to zero from the scale.[16,23]

In addition, the correlation coefficient between the item score and the scale score must be >0.200.[7] In this study, in the item analysis after the pilot application, two items were excluded from the scale because they were difficult to understand and the item score-scale score correlation coefficient was close to zero. In the main study, in which the reliability of the scale was tested, two items with an item score-scale score correlation coefficient of <0.200 were removed, the number of items in the 20-item scale became 18, and the item analysis was repeated. In the repeated item analysis of the 18-item scale, it was found that the item score-scale score correlation coefficient values ranged from 0.443 to 0.838.

One of the most common methods used to assess the internal consistency of the scale is the Cronbach's alpha reliability coefficient. High values of the Cronbach's alpha reliability coefficient indicate that the items of the scale are

Table 2. Explanatory Factor Analysis Results for the Candidate Scale

ITEM NUMBER	FACTOR LOADS
Item 1	0.623
Item 2	0.621
Item 3	0.580
Item 4	0.561
Item 5	0.823
Item 6	0.784
Item 7	0.870
Item 8	0.483
Item 9	0.814
Item 10	0.579
Item 11	0.781
Item 12	0.791
Item 13	0.803
Item 14	0.688
Item 15	0.777
Item 16	0.778
Item 17	0.812
Item 18	0.811
Eigen value	9.696
Factor explanation	53.868
KMO Value	0.944
Bartlett test of sphericity	$\chi^2 = 312.048$, $p < 0.001$

KMO, Kaiser-Meyer-Olkin.

consistent within themselves, and that the scale measures a single trait.[12]

A Cronbach's alpha reliability coefficient below 0.40 indicates that the scale is unreliable, a value between 0.40 and 0.60 indicates low reliability, a value between 0.60 and 0.80 indicates high reliability, and 0.80 and 1.00 between the scales indicates that the scale is quite reliable.[24] Another source states that a Cronbach's alpha reliability coefficient above 0.70 indicates high reliability.[17,25] In this study, the Cronbach's alpha reliability coefficient calculated for the remaining 18 items after the 2 items were removed after the item analysis was 0.947. The fact that this value is at a sufficient level according to the literature shows that the questions in the scale are consistent and quite reliable.

Table 3. Standardized Loads, *z* Values, *p*Values, and Error Values of *z* Values of the Model

ITEM NUMBER	STANDARDIZED LOADS	*z* VALUES	*p*	ERROR VALUES
Item 1	0.57	12.979	<0.001	0.063
Item 2	0.58	12.968	<0.001	0.068
Item 3	0.56	12.989	<0.001	0.082
Item 4	0.67	12.812	<0.001	0.048
Item 5	0.84	11.949	<0.001	0.028
Item 6	0.84	11.963	<0.001	0.032
Item 7	0.85	11.836	<0.001	0.031
Item 8	0.45	13.098	<0.001	0.071
Item 9	0.82	12.190	<0.001	0.034
Item 10	0.53	13.027	<0.001	0.062
Item 11	0.79	12.355	<0.001	0.039
Item 12	0.76	12.539	<0.001	0.043
Item 13	0.73	12.641	<0.001	0.042
Item 14	0.67	12.809	<0.001	0.053
Item 15	0.81	12.243	<0.001	0.030
Item 16	0.81	12.223	<0.001	0.033
Item 17	0.81	12.217	<0.001	0.029
Item 18	0.85	11.842	<0.001	0.028

The validity of the Attitude Scale toward the Use of Telemedicine Services was tested with face validity, content validity, and construct validity. Content validity is the determination of the scale as a whole and the extent to which each item serves the purpose of the scale.[26] If the developed measurement

Table 4. Fit Indices and Acceptable Limits for the Confirmatory Factor Analysis Model of the Candidate Scale

COMPLIANCE CRITERIA	VALUES OF THE DEVELOPED SCALE	ACCEPTABLE VALUES[17]
χ^2/SD	3.88	≤5
RMSEA	0.091	≤0.10
SRMR	0.046	≤0.10
CFI	0.914	≤0.95
TLI (NNFI)	0.902	≤0.95

CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual, TLI (NNFI), non-normed fit index.

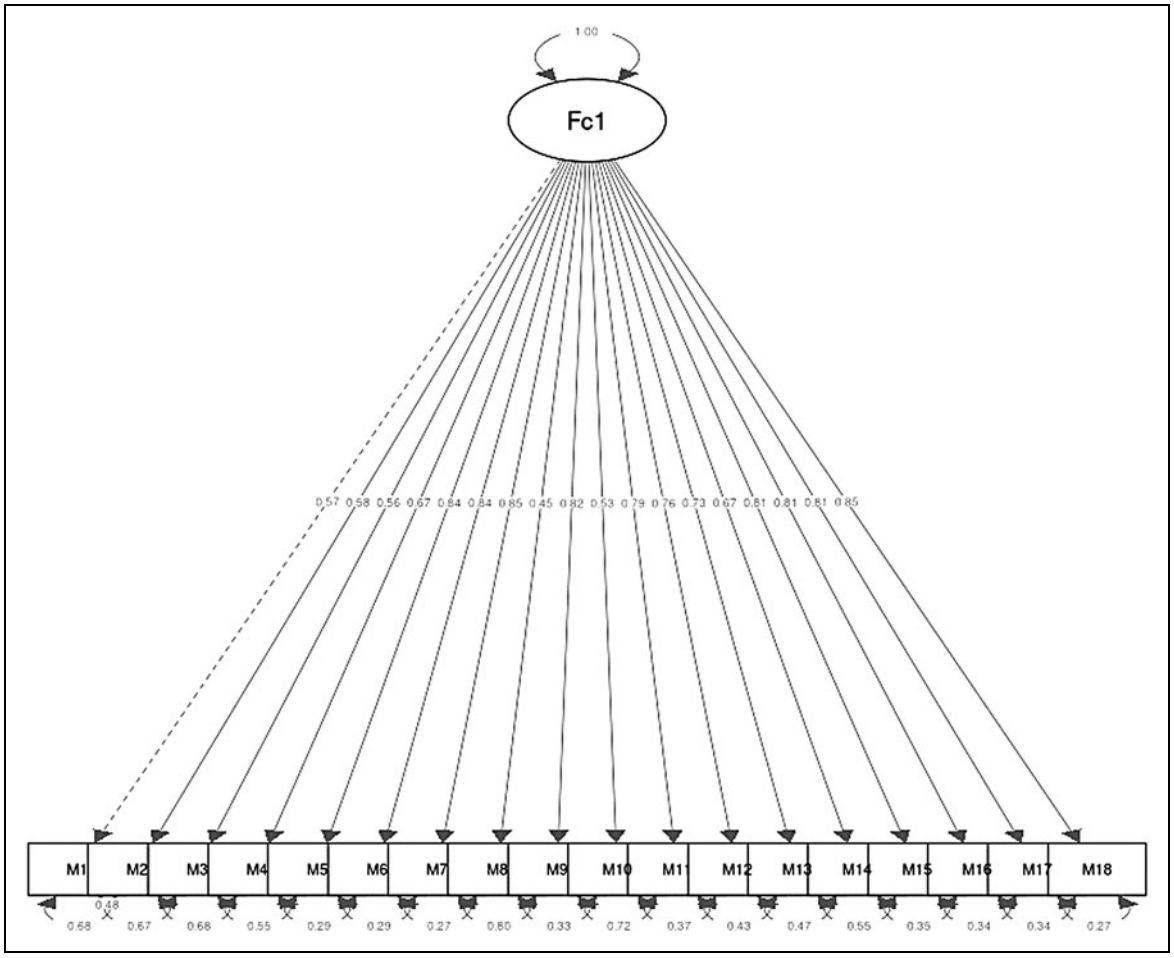

Fig. 3. CFA path diagram of the candidate scale. CFA, confirmatory factor analysis.

tool includes all subtitles of the subjects to be measured, it can be said that the instrument has content validity.[12] Consulting experts and/or calculating the correlation coefficient between another test with proven validity and reliability that measures the same coverage and the newly developed test are the most commonly used methods in content validity.

The suitability of the items selected in the expert opinion with the characteristics to be measured is evaluated.[27] The content validity of the candidate scale developed in this study, which consisted of 29 questions, was conducted by a team of 22 experts. The experts were asked to evaluate the appropriateness of each item in the candidate scale in terms of content and whether the items adequately represented the construct to be measured. The expert opinions were evaluated and the items suggested for modification were ranked. In accordance with the experts' opinions, 7 items were removed from the scale and the number of items in the candidate scale was reduced to 22.

Factor loadings in EFA are correlation coefficients that express the relationship of items to the scale and their relative weights.[12] Acceptable limits of factor loadings vary in the literature. Some researchers state that loadings of 0.70 and above can explain the structure well, loadings between 0.50 and 0.70 are meaningful for application, and loadings between 0.30 and 0.40 are the lowest acceptable loadings.[12,28,29] Some sources state that the lowest limit is 0.32.[14,20,30] In addition, there are sources that state factor loads of 0.45 and above are considered good.[15] In this study, the acceptable limit for factor loadings was determined to be 0.45 and above. It was found that the factor loadings of each item obtained as a result of EFA were above 0.45.

The factor structure of the scale revealed by EFA must be confirmed by CFA.[31] According to the values of goodness-of-fit indices obtained as a result of CFA, it is decided whether there is sufficient model-data fit or not.[20] It is controversial which indices should be reported and how many should be considered fit. If most indices are at a sufficient level, it is accepted that the model fit is good.[32]

For this study, the χ^2/SD value was 3.88, the RMSEA value was 0.091, the SRMR value was 0.046, the CFI value was

Table 5. Comparison of Total Scale Scores and Some Characteristics of Individuals

CHARACTERISTIC	TOTAL SCALE SCORE			
	N	MEAN ± SD	MEDIAN (Q1–Q3)	*p*
Presence of disabled and/or dependent persons at home				
None	533	59.12 ± 14.20	61.00 (51.00–69.00)	0.008*
There is	67	63.97 ± 15.29	66.00 (55.00–73.00)	
The health facility he/she goes to first when he/she has a health problem				
Family Health Centers	285	61.87 ± 13.51	63.00 (54.00–70.00)	0.009***
State Hospitals	107	56.07 ± 14.21	57.00 (46.00–67.00)	
Medical Faculty Hospitals	73	57.65 ± 14.52	59.00 (48.50–68.50)	
Private Hospitals	82	58.65 ± 15.41	61.50 (50.00–69.00)	
City Hospitals	53	59.35 ± 15.95	61.00 (47.50–69.00)	
Proximity of the family health centers of the general practitioners to their place of residence				
No. Not close	98	53.93 ± 16.22	55.00 (42.00–66.00)	<0.001*
Yes. It is close	502	60.78 ± 13.75	62.00 (52.75–69.25)	
Status of visiting a family doctor in the last month				
No	330	58.05 ± 15.00	60.00 (47.00–68.00)	0.002**
Yes	270	61.62 ± 13.37	62.00 (53.00–70.00)	
Status of applying to a hospital in the last month				
No	288	58.01 ± 14.76	59.00 (48.00–68.00)	0.007**
Yes	312	61.19 ± 13.89	63.00 (53.00–69.75)	

*Mann–Whitney *U* test.

***T*-test on independent groups.

***Kruskal–Wallis H test.

SD, standard deviation.

0.914, and the TLI (NNFI) value was 0.902. It was found that the values found were within acceptable limits. According to the CFA results, it was found that the fit indices of the 18-item and unidimensional structure of the scale were at acceptable levels. According to results of the factor analysis, the scale was found to have construct validity. As a result, it was concluded that the Attitude Scale toward the Use of Telemedicine Services is a valid and reliable scale.

FACTORS THAT MAY BE ASSOCIATED WITH PARTICIPANTS' SCORES ON THE ATTITUDES TO USING TELEMEDICINE SERVICE SCALE

In this study, the scale scores of people with chronic diseases were found to be higher than those of people without chronic diseases. Studies have shown that improved access to care through telemedicine can lead to earlier detection of disease, better adherence to treatment, and improved quality of life for people with chronic conditions.[33,34] A systematic review and meta-analysis study conducted by Ma et al. showed that telemedicine has a positive effect on the management of patients with diabetes, hypertension, and rheumatoid arthritis. This systematic review and meta-analysis study found that telemedicine increased medication adherence in patients with rheumatoid arthritis and reduced systolic blood pressure in patients with hypertension.[35]

Systematic review and meta-analysis studies examining the effects of telemedicine services in patients with diabetes have shown that this service improves glycemic control in patients with diabetes and that telemedicine monitoring of patients with diabetes is more effective than face-to-face health care services.[36–39] Studies show that telemedicine services can be an alternative to face-to-face health services for several

chronic diseases. The positive attitude of people with chronic diseases in society also shows that telemedicine can be used as a useful tool for the management of various chronic diseases.

It was found that the total scale scores of participants who had a disabled and/or dependent person at home were significantly higher than those who did not. People with disabilities and/or care needs are a vulnerable population with social and economic disadvantages in society. They also experience inequalities that affect their access to health care and ultimately result in them receiving far less health care than people without disabilities.[40] Accessing or communicating with health care providers through telemedicine services for people with disabilities and/or long-term care needs can help to address these inequalities.

A significant difference was found between the institution to which they first presented and the total scale score for health problems, and it was noted that this difference was due to the fact that the scale scores of those whose first presentation was to a family health center were higher than those whose first presentation was to a government hospital. It was also found that the scale scores were higher for those who had visited a family health center or hospital in the last month than for those who had not visited a family health center or hospital in the last month. Studies have shown that the use of telemedicine services, especially in primary care, is more acceptable and applicable to both patients and health professionals.[41]

Conclusions

As a result of this research, which was conducted on individuals 18 years of age and older who had applied to family health centers in the Meram district of Konya, a new measurement tool was developed that can be used to measure attitudes toward the use of telemedicine services. The reliability and validity study of this developed measurement tool showed that it is suitable for use with individuals older than 18 years. According to results of the reliability and validity analyses, the final version of the scale consists of 18 items and one dimension. Responses to 5-point Likert-type items are scored between 1 and 5.

When calculating the scale score, the eighth item, which is negative in meaning, should be reverse coded and the total score calculated after reverse coding. The total score that can be obtained from the scale varies between 18 and 90 and there is no estimation score. As the total score obtained from the scale increases, it is assumed that individuals have a positive attitude toward the use of telemedicine services.

In the study group, which consisted of a total of 600 people, employment status, presence of chronic diseases, presence of disabled people and/or people needing care at home, type of health facility first consulted in case of health problems, proximity to family doctors, and visits to family health centers or hospitals in the last month were identified as variables related to the total number of visits.

It is believed that the use of this developed scale by different researchers and the results obtained afterward will provide useful information to society and health planners. It is envisaged that measuring attitudes toward telemedicine services with a standard measurement tool may be useful in informing and educating about this service in regions where attitudes are low, and in undertaking studies to expand its use in regions where attitudes are high. The use of this developed scale may help to define different variables that may be associated with new studies to be conducted in different regions and/or social groups and negative attitudes toward telemedicine services. These results may also assist in the identification of barriers to telemedicine services.

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No competing financial interests exist.

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