ORIGINAL ARTICLE

Effect of atrial fibrillation on quality of life (AFEQT) questionnaire: A Turkish validity and reliability study

Atriyal fibrilasyonun yaşam kalitesi (AFEQT) anketi: Türkçe geçerlilik ve güvenilirlik çalışması

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ABSTRACT

Objective: This study aimed to determine the validity and reliability of the atrial fibrillation effect on quality of life (AFEQT) questionnaire and evaluate the quality of life of patients with atrial fibrillation (AF).

Methods: This was a methodological study that included 204 patients with AF over the age of 18 who participated voluntarily in the study. Data were collected using a structured questionnaire, the AFEQT questionnaire, and the University of Toronto atrial fibrillation severity scale (AFSS). The AFEQT questionnaire was translated into Turkish and presented to an expert panel, after which a pilot study was carried out with 20 patients for linguistic equivalence and cultural adaptation. The reliability of the AFEQT questionnaire was determined using Cronbach's alpha and item-total correlation coefficient analyses.

Results: The Cronbach's alpha value was found to be 0.91, and the scale and subscale item-total correlation values ranged from 0.36 to 0.91. The validity of the AFEQT questionnaire was determined by construct, concurrent, and discriminant validity analyses. The factor loads of the AFEQT questionnaire ranged from 0.37 to 0.94 and the ratio was χ^2/df=2.43 in the confirmatory factor analysis. A negative and highly significant relationship was found in concurrent validity between the AFEQT questionnaire and the AFSS. When AF risk factors were compared with the AFEQT questionnaire, it showed that AF-related risk factors negatively affected patients' quality of life. The AFEQT questionnaire was suitable in terms of discriminant validity.

Conclusion: The Turkish AFEQT questionnaire was found to be reliable and valid; therefore, we recommend its use to evaluate the quality of life of patients with AF.

ÖZET

Amaç: Bu çalışma, atriyal fibrilasyonun yaşam kalitesi (AFEQT) anketinin geçerliliğini ve güvenilirliğini belirlemek ve atriyal fibrilasyon (AF) hastalarının yaşam kalitesini değerlendirmek için yapılmıştır.

Yöntemler: Çalışma, 18 yaşından büyük ve gönüllü olarak katılan 204 AF hastasını içeren bir metodolojik tasarım kullanılarak gerçekleştirildi. Veriler yapılandırılmış bir anket, AFEQT anketi ve Toronto Üniversitesi atriyal fibrilasyon şiddet ölçeği (AFSS) kullanılarak toplandı. AFEQT anketi Türkçeye çevrildi, kapsam geçerliliği için uzman paneline sunuldu. Ardından dilsel denklik ve kültürel uyumu sağlamak için 20 hasta ile gerçekleştirilen bir pilot çalışma yapıldı. AFEQT anketinin güvenilirliği için; iç tutarlık (Cronbach's alpha) ve madde-toplam korelasyon katsayısı analizleri ile belirlendi.

Bulgular: AFEQT Cronbach's alpha değeri 0.91 olarak bulundu ve genel -alt boyut madde-toplam korelasyon değerlerinin 0.36-0.91 arasında olduğu saptandı. AFEQT anketinin geçerliliği için; yapı geçerliliği, eş zaman geçerliliği ve ayırt edici geçerlilik analizleri yapıldı. AFEQT anketinin faktör yüklerinin 0.37 ile 0.94 arasında, doğrulayıcı faktör analizinde ise Ratio χ^2/df=2.43 olduğu bulundu. AFEQT ve AFSS arasındaki eş zaman geçerliliğine bakıldığında, negatif yönde-yüksek düzeyde anlamlı bir ilişki saptandı. AF risk faktörleri AFEQT anketi ile karşılaştırıldığında, AF ile ilgili risk faktörlerinin hastaların yaşam kalitesini olumsuz etkilediği ve AFEQT anketinin ayırt edici geçerlilik açısından uygun olduğu belirlendi.

Sonuç: Türkçe AFEQT'nin güvenilir ve geçerli olduğu, AF'li hastaların yaşam kalitesini değerlendirmede kullanılabileceği önerilmektedir.

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Atrial fibrillation (AF) is the most common form of cardiac arrhythmia seen in clinics.[1-3] As AF causes many clinical symptoms and complications, it negatively affects patients' quality of life (QoL).[4, 5] Depression and anxiety lasting more than 6 months can be observed in patients with AF, which also negatively affects their QoL.[6]

Individuals experience difficulty maintaining their daily activities (such as walking, running, climbing stairs, and carrying things) because of symptoms such as palpitations, dizziness, syncope, chest pain, and weakness which frequently develop in patients with AF. They experience worry and anxiety and restrict their lifestyles because of these difficulties.[4] It has been reported that if heart rate and rhythm control are maintained in patients with AF, their QoL increases and depression and anxiety decrease.[4-7]

Previous studies have identified that patients with AF experience a significant reduction in QoL. Therefore, the evaluation of QoL by health professionals is an important part of the assessment and follow-up of patients with AF in terms of patient-centered care. Several have been developed to address this need. Among the tools published, the atrial fibrillation effect on quality of life (AFEQT) questionnaire has performed the best in terms of psychometric properties. AFEQT is an atrial fibrillation specific health related QoL questionnaire that has already been used in various clinical settings. Although the impact of AF on QoL is acknowledged by patients and health professionals, there is currently no validated, disease-specific questionnaire to measure the extent to which AF affects patients in Turkey. This study aimed to culturally adapt the AFEQT for use in Turkish patients with AF.[8]

METHODS

Objective

This study was carried out to determine the validity and reliability of the AFEQT questionnaire and evaluate the QoL of patients with AF in Turkey.

Study questions

Is the Turkish version of the AFEQT questionnaire a valid and reliable measurement tool for determining the QoL of patients with AF?

Abbreviations:

AF	*Atrial fibrillation*
AFEQT	*Atrial fibrillation effect on quality of life*
AFSS	*Atrial fibrillation severity scale*
AGFI	*Adjusted goodness of fit index*
CFA	*Confirmatory factor analysis*
CFI	*Comparative fit index*
CVI	*Content validity index*
GFI	*Goodness of fit index*
KMO	*Kaiser-Meyer-Olkin*
QoL	*Quality of life*
RMR	*Root mean square residual*
RMSEA	*Root mean square error of approximation*

Time, place, and characteristics of the study

The study was conducted in a state hospital located in Aydın, a city in western Turkey, from November 2016 to December 2017. This hospital is affiliated with the Turkish Ministry of Health and provides secondary healthcare.

Study sample

The literature suggests including 10 persons in a study for each item of the questionnaire to be validated.[9-13] The AFEQT questionnaire included 20 items; therefore, the study was carried out with 204 patients. These patients were randomly selected from among those with AF who were hospitalized in the cardiology department and monitored in the cardiology outpatient clinic. Patients who were older than 18 and participated voluntarily were included in the study.

Data collection tools

The study data were collected using a patient information form, the AFEQT questionnaire, and the University of Toronto atrial fibrillation severity scale (AFSS). The data collection tools were as follows:

Patient information form: Developed by the researchers and based on the literature,[1-14] it consists of 2 sections. The first asks about the participants' socio-demographic characteristics (6 items) and the second asks about their health status and habits (7 items).

AFEQT questionnaire: It was developed by Spertus et al.[8] to evaluate the QoL of patients with AF. It has 20 items with 4 subscales: symptoms (items 1-4), daily activities (items 5-12), treatment concern (items 13-18), and treatment satisfaction (items 19 and 20). The last 2 items about treatment satisfaction are not part of the AFEQT questionnaire; however, they are scored like the other subscales (Appendix 1 and 2).[8]

Scale scoring system: Scale and subscale scores range from 0-100, with 0 indicating that QoL is affected negatively and 100 indicating that the QoL is not affected negatively.[8]

Calculating the scores of the scales

Calculation of symptom subscale scores: 100–([sum of severity for questions 1, 2, 3, and 4 answered–number of questions answered]×100)/(total number questions answered×6)

Calculation of daily activities subscale score: 100–([sum of severity for questions 5, 6, 7, 8, 9, 10, 11, and 12 answered–number of questions answered]×100)/(total number questions answered×6)

Calculation of treatment concern subscale score: 100–([sum of severity for questions 13, 14, 15, 16, 17, and 18 answered–number of questions answered]×100)/(total number questions answered×6)

Calculation of treatment satisfaction subscale score: 100–([sum of severity for questions 19 and 20 answered–number of questions answered]×100)/(total number questions answered×6).[8]

Interpretation

Overall and subscale scores range from 0-100. A score of 0 corresponds to complete disability while a score of 100 corresponds to no disability. For example, if a patient answered '1' to all questions on the treatment concern subscale, the subscale score would be 100–([6–6]/6×6)×100 = 100, revealing that the patient has no disability. Conversely, if a patient answered '7' to all questions on the treatment concern subscale, the subscale score would be 100–([42-6]/6×6)×100 = 0, revealing that the patient is extremely limited.[8]

University of Toronto atrial fibrillation severity scale: This Likert-type scale was developed by Maglio et al.[15] It includes 19 items in 3 sections: AF burden, healthcare utilization, and severity of AF-related symptoms. The AFSS is a disease-specific QoL questionnaire. Permission to use the scale was obtained from Kahya Eren et al.[16] who did its validity and reliability study in 2014. The AF burden section includes questions about overall wellbeing (scored from 0 to 10) and the frequency, duration, and overall severity of AF episodes. The healthcare utilization section includes questions about the presence and the frequency of cardioversions, specialist appointments, emergency room visits, and hospitalizations within the past year. The severity of AF section includes questions on the presence and severity of individual symptoms attributable to AF (such as palpitations, dyspnea, dizziness, weakness, and chest pain). A measure of total AF burden is obtained by combining the measures of frequency, duration, and overall severity of the AF episodes. Each of the 3 sections contributes equally and ranges from 1 to 10 to yield total AF burden scores ranging from 3 to 30. Higher scores indicate more AF burden. Severity of symptoms is measured by adding up the values of the questions in that section to yield a total score ranging from 0 to 35. Higher scores indicate more severe symptoms.[15-17]

Validity and reliability of the adaptation of the AFEQT questionnaire for Turkey

Permission was obtained from Spertus et al.[8] who developed the scale for language validity. The AFEQT questionnaire was professionally translated into Turkish with back-translation into English for verification for this study.[11-18]

Internal consistency (Cronbach's alpha) analysis was used to determine reliability.[9, 19, 20] Item-total test correlation coefficients were used to determine the items on the scale, factor analysis, and distinctive power of the items. The standard for item-total score correlation coefficient was >0.30.[11-19]

The Turkish version of the scale was submitted to an expert panel comprising 3 cardiology specialists and 2 academic nurses to determine the validity of the content and suitability of the language, and revisions were made according to their suggestions. The scale was back-translated into English and presented to Spertus et al.[8] for an opinion.

After expert opinions were obtained, a pilot study was carried out with 20 patients who met the inclusion criteria to determine how understandable the items of the AFEQT questionnaire were to patients and make the necessary adjustments. The latter was done for the items that were hard to understand and the final form of the scale was achieved.[19-21]

The validity of the construct was assessed using exploratory factor analysis (extraction method: principal axis factoring, rotation method: varimax) and confirmatory factor analysis. Bartlett's test was used to determine whether the data were suitable for factor analysis, and the Kaiser-Meyer-Olkin (KMO) test was used to determine sample sufficiency. In the exploratory factor analysis, items with a factor load value of 0.30 and above were included in the factor structure.

Pearson's correlation analysis was carried out to determine the concurrent validity of the AFSS and the AFEQT questionnaire. The threshold for statistical significance was $p<0.05$.

The relationship between patients' risk factors and scale scores was analyzed using Student's t-test to determine discriminant validity. The type I error level was 0.05.[19]

Ethical approval and hospital permission

The Adnan Menderes University medical faculty non-invasive clinical research ethics committee in Aydın, Turkey, approved the study (protocol no: 2016/968) and permission was obtained from the public hospital community (11.14.2016-E.37084).

Administration of data collection tools

The data were collected by the researchers in 15-20 minute face-to-face interviews after giving patients who met the inclusion criteria the necessary explanations and obtaining their written consent.

Statistical analysis

The data were evaluated using the software SPSS version 21 for Windows (IBM Corp.; Armonk, NY, USA) and confirmatory factor analysis (CFA) was conducted using the software SPSS Amos Graphic.

In the descriptive statistics for socio-demographic characteristics, the means, standard deviations, min-max values, medians, and modes were used for continuous data. Numbers and percentage values were used for countable data. In analyzing the differences between the groups, $p<0.05$ was used as the threshold for statistical significance.

Variables

The independent variables were age, sex, marital status, education level, employment status, income level, previous hospitalizations, presence of chronic illness, type of AF, and duration of AF diagnosis.

The dependent variables were the AFEQT questionnaire and AFSS scores.

RESULTS

This study was conducted with 204 patients to determine the validity and reliability of the AFEQT questionnaire for Turkey and evaluate the QoL of patients with AF using a cross-sectional and methodological design.

The mean age of the participants was 71.33±10.34 (44-93) years. Of the participants, 65.2% were women, 61.3% were married, and 51% had completed primary school. Furthermore, 94.6% did not have a paying job and 59.8% had equal income and expenditure levels. The time passed since their AF diagnosis was 70.90±87.11 (1-516) months. Of the patients, 88.2% had permanent type AF, 55.3% used Coumadin, and 51.5% had hypertension.

Studies conducted within the scope of the Turkish validity of the AFEQT questionnaire

1. The scale was translated and back-translated.
2. The opinion of experts was taken to determine the validity of the content. The content validity index (CVI) ranged from 0.83-1.00. CVI values higher than 0.80 indicate content validity.[22]
3. A pilot test was carried out to evaluate the comprehensibility of the scale by Turkish people.
4. Factor analysis and CFA were carried out to determine the construct validity of the AFEQT questionnaire.

KMO and Bartlett's tests were used to evaluate the suitability of the scale for factor analysis KMO and Bartlett's tests were found as 0.826 and 3472.468, (p=0), respectively, which indicated that factor analysis could be carried out. Factor analysis found 5 factors that had eigenvalues >1 and explained 75.67% of the total variance (Table 1). The factor loadings of items 1-4 were >0.30 and they loaded on the third factor. The factor loadings of items 1 and 2 loaded on the third and fourth factors (0.72-0.73 and 0.43-0.37, respectively). The 2 questions were found to be similar to those loaded on the third factor, so items 1 and 2 were considered appropriate for the third factor. Items 1 and 2 are in the symptoms subscale in the original version of this scale (Table 1).

The factor loadings of items 5-12 were >0.30, and they loaded on the first factor. The factor loadings of items 5 and 6 loaded on the first and third factors (0.47-0.49 and 0.59-0.59, respectively). Items 5 and 6 were similar to those that loaded on the first factor; thus, they were considered appropriate for the first factor. Items 5 and 6 are in the daily activities subscale in the original version of this scale. Difficulties and restrictions can be discussed together, in terms of content, in Turkey; therefore, it was considered appropriate to group them under the same subscale (Table 1).

Table 1. Results of factor loadings of the AFEQT questionnaire items via exploratory factor analysis

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
AFEQT 1			0.72	0.43	
AFEQT 2			0.73	0.37	
AFEQT 3			0.62		
AFEQT 4			0.68		
AFEQT 5	0.47		0.59		
AFEQT 6	0.49		0.59		
AFEQT 7	0.70				
AFEQT 8	0.74				
AFEQT 9	0.85				
AFEQT 10	0.83				
AFEQT 11	0.82				
AFEQT 12	0.83				
AFEQT 13				0.88	
AFEQT 14				0.86	
AFEQT 15		0.91			
AFEQT 16		0.85			
AFEQT 17		0.89			
AFEQT 18		0.89			
AFEQT 19					0.93
AFEQT 20					0.94
Total variance explained: 75.67%					

Extraction method: principal axis factoring; rotation method: Varimax; AFEQT: atrial fibrillation effect on quality of life.

Table 2. Results of the confirmatory factor analysis of the AFEQT questionnaire

Fit indices	Good fit levels	Acceptable fit levels	AFEQT questionnaire values
Ratio χ^2/df	≤3.0	≤4.0-5.0	2.43
GFI	≥0.90	≥0.85	0.83
AGFI	≥0.90	≥0.85	0.78
CFI	≥ 0.97	≥0.90	0.93
RMR	0-1.0	0-1.0	0.36
RMSEA	≤0.05	≤0.06-0.08	0.84

GFI: goodness of fit index; AGFI: adjusted goodness of fit index; CFI: comparative fit index; RMR: root mean square residual index; RMSEA: root mean square residual index; AFEQT: the atrial fibrillation effect on quality of life.

The factor loadings of items 13 and 14 were >0.30 in the fourth factor; thus, they may be appropriate for a different subscale. However, they were considered appropriate for the treatment concern subscale because they are in the original version of this scale and their meanings are similar to items 15 to 18 (Table 1).

Table 3. Results of the concurrent validity correlation analysis of the AFEQT questionnaire and the University of Toronto AFSS

	AFSS	
AFEQT questionnaire	Total AF burden severity of AF symptoms	
r*	-0.390	-0.789
p	0.00	0.00

*Pearson's correlation analysis.
AF: atrial fibrillation; AFEQT: analysis of the atrial fibrillation effect on quality of life; AFSS: atrial fibrillation severity scale.

The factor loadings of items 15-18 were >0.30 in the second factor; thus, they were considered appropriate for the second subscale. Items 13-18 are in the treatment concern subscale in the original version of the scale (Table 1).

The factor loadings of items 19 and 20 were >0.30 in the fifth factor and grouped under the treatment satisfaction subscale. Accordingly, no changes were made because they were appropriate in terms of meaning, although there were a number of distinctions and different factor loadings regarding the content in the Turkish version. The 4 subscales were considered appropriate, as in the original version of the scale (Table 1).

Results showed that the items had loadings that were similar to those of the original version of the scale. As the descriptive factor analysis found a difference (the original scale had 4 factors), CFA was carried out for the AFEQT questionnaire (Table 2). In this, the ratio regarding the suitability of the scale was χ^2/df=2.43 (Table 2). Values less than 5 were acceptable. Of the fit index values of the AFEQT questionnaire, the goodness of fit index (GFI) value was 0.83, the adjusted goodness of fit index (AGFI) value was 0.78, the comparative fit index (CFI) value was 0.93, the root mean square residual (RMR) value was 0.36, and the root mean square error of approximation (RMSEA) value was 0.84. These results showed that the Turkish version of the AFEQT questionnaire complied with the original scale in terms of its chi-square value (Table 2). GFI values greater than 0.90 indicate a good fit of the model and the AGFI is used to correct the GFI test with larger sample sizes. The

Table 4. Comparison of the patients' risk factors and their scores on the AFEQT questionnaire and its subscales

Subscales / Risk factors	Age <65	Sex (female)	With hypertension	With diabetes mellitus	With renal diseases	With pulmonary diseases
	p	*p*	*p*	*p*	*p*	*p*
Symptoms		0.013*		0.039*	0.025*	
Daily activities		0.009†	0.009†	0.035*	0.010†	0.005†
Treatment concern	0.040*	0.007†				
Treatment satisfaction		0.023*		0.049*		
Total AFEQT score		0.001†	0.031*		0.009†	

*$p \leq 0.05$.
†$p \leq 0.00$.
AFEQT: atrial fibrillation effect on quality of life.

Table 5. Cronbach's alpha values (N=204) for the atrial fibrillation effect on quality of life questionnaire

Scale and subscales	Cronbach's alpha
Symptoms	0.78
Daily activities	0.91
Treatment concern	0.86
Treatment satisfaction	0.95
Scale score	0.91

CFI value determines the difference between a model constructed by assuming that there are no relationships between the variables and its null model. RMR values closer to 0 indicate a better fit of the model being tested. The RMSEA is the value that indicates the approximate fit in the population.[22]

The correlation of the AFEQT questionnaire and the AFSS were compared to determine their concurrent validity (Table 3). High-level negative compliance was found between the AFEQT questionnaire and the AFSS. This arose from the fact that there were higher and lower scores on the 2 tests that led to different results for the severity of AF complaints.

The relationship between the patients' risk factors and their scores on the AFEQT questionnaire and its subscales were analyzed to determine discriminant validity (Table 4).

In analyzing the age factor, it was found that those <65 years of age experienced higher levels of treatment concern (p=0.04) than those > 65 years of age. In analyzing the sex factor, it was found that women were affected more negatively than men in these subscales: symptoms (p=0.013), daily activities (p=0.009), treatment concern (p=0.007), and treatment satisfaction (p=0.023). Individuals with hypertension were affected more negatively on the daily activities subscale (p=0.009) than those without hypertension. The patients with diabetes mellitus were affected more negatively in terms of symptoms (p=0.039), daily activities (p=0.035), and treatment satisfaction (p=0.049) than those without diabetes mellitus. Patients with renal disorder had lower scores on the symptoms (p=0.025) and daily activities (p=0.010) subscales than those with no such disorder. Individuals with pulmonary diseases were affected more negatively in the daily activities subscale (p=0.005) than those with no such disease. Women with hypertension and renal disorder had lower total scores and their QoL was affected negatively (Table 4).

Studies conducted within the scope of the determining the reliability of the AFEQT questionnaire for Turkey

The Cronbach's alpha of the AFEQT questionnaire was 0.91. The Cronbach's alpha coefficients for the subscales were: 0.78, 0.91, 0.86, and 0.95, respectively, for symptoms, daily activities, treatment concern, and treatment satisfaction (Table 5).

Item-total score correlations were calculated for the total items in the AFEQT questionnaire and their subscales. The item-total score correlations were 0.375-0.739, 0.651-0.802, 0.504-0.804, and 0.916, respectively, for the symptoms, daily activities, treatment concern, and treatment satisfaction subscales (Table 6).

The correlation values between the AFEQT questionnaire subscales were 0.75, 0.81, 0.81, and 0.38, respectively, for the symptoms, daily activities, treatment concern, and treatment satisfaction subscales (Table 7).

Table 6. Item-total correlations for the AFEQT questionnaire and its subscale items

Items (N=20)	General	Symptoms	Daily activities	Treatment concern	Treatment satisfaction
1st Item	0.601	0.731			
2nd Item	0.624	0.739			
3rd Item	0.499	0.521			
4th Item	0.364	0.375			
5th Item	0.659		0.703		
6th Item	0.683		0.713		
7th Item	0.646		0.752		
8th Item	0.521		0.670		
9th Item	0.587		0.802		
10th Item	0.598		0.766		
11th Item	0.489		0.651		
12th Item	0.462		0.669		
13th Item	0.618			0.514	
14th Item	0.617			0.504	
15th Item	0.490			0.718	
16th Item	0.518			0.736	
17th Item	0.520			0.716	
18th Item	0.595			0.804	
19th Item	0.433				0.916
20th Item	0.402				0.916

AFEQT: atrial fibrillation effect on quality of life.

Table 7. The subscale correlation values for the AFEQT questionnaire

Subscales	Subscale correlations
Symptoms	0.75
Daily activities	0.81
Treatment concern	0.81
Treatment satisfaction	0.38

AFEQT: atrial fibrillation effect on quality of life.

DISCUSSION

The AFEQT questionnaire is a novel disease-specific QoL instrument for patients with atrial fibrillation/flutter.[23] This study reports on the first cross-cultural validation of the AFEQT questionnaire with the development of its Turkish version.

In the validity study of the AFEQT questionnaire for Turkey:

The scale was adapted to Turkish by determining the validity of the language using translation and back-translation[24-27] and the validity of the content using the Davis technique.[24, 28, 29]

Factor analysis is reported to be the best method to determine the construct validity of a scale.[24] Factor analysis and CFA were carried out to determine the construct validity of the AFEQT questionnaire. In the CFA, the fit index was χ^2=2.43 (Table 1). The literature suggests the fit index value from CFA should be less than 5.[30-33] As a result, it was deemed appropriate–in adapting the 20-item AFEQT questionnaire to Turkish society–to keep the original scale design without making any structural changes. CFA showed that compliance between subscales and items was achieved.

A correlation analysis was carried out with the AFSS scale to determine the concurrent validity of the AFEQT questionnaire (Table 2). The literature states that correlation scores between the 2 scales

closer to 1 indicate a good concurrent validity.[9, 34, 35] This study found that there was a negative and high-level significant relationship between the scales. This shows that concurrent validity between AFEQT questionnaire and AFSS was achieved.

Another way to assess the validity of a scale is to test its discriminant validity. Certain situations that are risk factors for AF were compared with the AFEQT questionnaire and subscale scores to determine the discriminant validity of the AFEQT questionnaire (Table 3). According to the literature, major risk factors in the development of AF are: age (60 and older), sex, hypertension, coronary artery disease, valvular heart disease, chronic pulmonary diseases, cardiac insufficiency, cardiomyopathy, congenital heart disease, and pulmonary embolism.[1, 36-39] Previous studies have reported that AF is seen in more than half of the elderly (those > 75), with more than half of the patients being women (56% and 58.5%), and approximately two-thirds having hypertension (65.7% and 71.9%), one-fourth having diabetes mellitus (22.4% and 25.9%), and less than half having coronary heart disease (31% and 44.8%), cardiac insufficiency (13.4% and 34.4%), or stroke (17.1%).[39, 40]

This study found a significant relationship between patients who are <65 years of age; female; have hypertension, diabetes mellitus, renal and pulmonary diseases and their scores on the AFEQT questionnaire and its subscales (Table 3). It was determined that the AF risk factors negatively affected the QoL of patients and that the AFEQT questionnaire was suitable in terms of discriminant validity.

In analyzing the results of the reliability of the AFEQT questionnaire for Turkey, the Turkish AFEQT questionnaire showed a high internal consistency for the total scores (Cronbach's alpha=0.91) and similar alpha coefficients for the 4 subscales (Table 4). The Cronbach's alpha coefficient of the original AFEQT questionnaire was 0.88;[8] however, it was reported to be 0.97 by a study validating the AFEQT for Greece.[40] The Cronbach's alpha coefficient of the Turkish version of the scale was found to be similar to those of other studies.

Item-total score correlation analysis was carried out to determine the reliability of the AFEQT questionnaire. The literature states that as the correlation coefficient between an item and total value increases positively, the reliability and efficacy of that item increase accordingly.[24, 41] If the correlation value of the scale items is 0.20, they cannot be included in the scale, while values between 0.20-0.30 need adjustment, values between 0.30-0.40 are at a good level, and values higher than 0.40 have a good level of discriminant characteristics.[34] Item-total correlation analysis showed that all items except item 4 had values above 0.40, and their discriminant characteristics were at a good level. The discriminant characteristics of the AFEQT questionnaire were found to be at a good level (Table 5).

The total mean score of patients with AF on the AFEQT questionnaire was 34.926±17.846. Considering the scoring system and evaluation of the scale, it was determined that the patients' QoL was affected negatively by AF. In the United Kingdom, Raine et al.[42] found that the total mean score on the AFEQT questionnaire was 51.5±22.0. Tailachidis et al.[40] found that participants' total score average on the AFEQT questionnaire was 72.9 in Greece. Ha et al.[43] examined the QoL of patients with AF in Canada and obtained a total mean score of 77.6±19.2 on the AFEQT questionnaire. Comparing these 3 studies with this study conducted in Turkey indicated that patients with AF in Turkey had lower QoL levels according to their AFEQT questionnaire scores.

Limitations

The limitation of this study was that it was conducted at a single location (Aydın State Hospital). This study was a single-center study with a relatively small sample size and a rather small representation of patients with paroxysmal AF.

Conclusion

The Turkish AFEQT questionnaire was found to be reliable and valid according to the validity of its language, content, concurrency, discriminant validity, internal consistency, and homogeneity.

Nevertheless, applying the Turkish AFEQT in clinical settings could further enable health professionals to capture their patients' experiences of AF and the possible effect of AF treatment on their QoL, providing them an additional tool in efforts to provide patient-centered care.

The Turkish AFEQT questionnaire is recommended for use in evaluating the of the QoL of patients with AF in Turkey.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Aydın Adnan Menderes University Non-invasive Clinical Research (Approval Date: October 17, 2016; Approval Number: E.43207).

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Keywords: Atrial fibrillation; AFEQT; validity and reliability

Anahtar Kelimeler: Atriyal fibrilasyon; AFEQT; geçerlilik ve güvenilirlik

Appendix 1. Turkish version of the AFEQT questionnaire

Atriyal FibrilasyonunYaşam Kalitesi Üzerine Etkisi Anketi

Bölüm 1. Atriyal Fibrilasyonun Oluşumu İsim veya Kimlik No:

Şu anda/halihazırda atriyal fibrilasyonunuz var mı? Evet ( ) Hayır ( )

Eğer cevabınız hayır ise en son ne zaman Atriyal Fibrilasyon nöbeti geçirdiğinizi hatırlıyor musunuz? (Lütfen sizin durumunuzu en iyi açıklayan bir cevabı seçiniz)

(...) Bugün erken saatlerde

(...) Geçtiğimiz hafta içerisinde

(...) Geçtiğimiz ay içerisinde

(...) 1 ay ile 1 yıl arası önce

(...) 1 yıldan fazla bir süre önce

(...) Hiçbir zaman Atriyal fibrilasyon geçirdiğimi hatırlamıyorum

Bölüm 2. Aşağıdaki sorular Atriyal fibrilasyonun yaşam kalitenizi nasıl etkilediği ile ilgilidir.

1 ila 7 arasında derecelendirmeniz gerekirse, son 4 hafta içerisinde, geçirmiş olduğunuz atriyal fibrilasyon atağı sonucunda aşağıda belirtilen durumlardan ne ölçüde rahatsız oldunuz? *(Lütfen sizin durumunuzu en iyi açıklayan bir numarayı daire içine alınız.)*

	Hiç rahatsız olmadım veya bu belirtiyi yaşamadım	Neredeyse hiç rahatsız olmadım	Çok az rahatsız oldum	Kısmen rahatsız oldum	Oldukça rahatsız oldum	Çok rahatsız oldum	Aşırı derecede rahatsız oldum
1. Kalp çarpıntısı, kalbin teklemesi veya hızlı atmasından	1	2	3	4	5	6	7
2. Düzensiz kalp atımından	1	2	3	4	5	6	7
3. Kalp atışında bir duraklama olmasından	1	2	3	4	5	6	7
4. Denge kaybı veya baş dönmesinden	1	2	3	4	5	6	7

1 ila 7 arasında derecelendirmeniz gerekirse, son 4 hafta içerisinde, geçirmiş olduğunuz atriyal fibrilasyon sonucunda aşağıda belirtilen yetilerde ne ölçüde kısıtlanma yaşadınız? *(Lütfen sizin durumunuzu en iyi açıklayan bir numarayı daire içine alınız.)*

	Hiç kısıtlanmadım	Neredeyse hiç kısıtlanmadım	Çok az kısıtlandım	Kısmen kısıtlandım	Oldukça kısıtlandım	Çok kısıtlandım	Aşırı derecede kısıtlandım
5. Eğlenceli vakit geçirme, spor yapma ve hobilerinle ilgilenebilmede	1	2	3	4	5	6	7
6. Arkadaşları ve ailesiyle iletişim kurma ve bir şeyler yapabilme	1	2	3	4	5	6	7

1 ila 7 arasında derecelendirmeniz gerekirse, son 4 hafta içerisinde, geçirmiş olduğunuz atriyal fibrilasyon sonucunda aşağıda belirtilen fiziksel aktivitelerde ne ölçüde zorlandınız? *(Lütfen sizin durumunuzu en iyi açıklayan bir numarayı daire içine alınız.)*

	Hiç zorlanmadım	Neredeyse hiç zorlanmadım	Çok az zorlandım	Kısmen zorlandım	Oldukça zorlandım	Çok zorlandım	Aşırı derecede zorlandım
7. Yorgunluk, bitkinlik veya güç kaybı nedeniyle bir aktivitede bulunurken	1	2	3	4	5	6	7

8. Nefes darlığı nedeniyle fiziksel aktivite yaparken	1	2	3	4	5	6	7
9. Egzersiz yaparken	1	2	3	4	5	6	7
10. Tempolu yürüyüş yaparken	1	2	3	4	5	6	7
11. Yokuş yukarı hızlı yürürken veya "poşet-paket" gibi şeyleri hiç durmadan taşırken ve dinlenmeden bir kat merdivenden çıkarken	1	2	3	4	5	6	7
12. Mobilya kaldırma veya yerini değiştirme, koşma, tenis veya basketbol gibi yorucu hareketli spor aktivitelerinde bulurken	1	2	3	4	5	6	7

1 ila 7 arasında derecelendirmeniz gerekirse, son 4 hafta içerisinde, geçirmiş olduğunuz atriyal fibrilasyon sonucunda aşağıda belirtilen duygular sizi ne ölçüde rahatsız etti? *(Lütfen sizin durumunuzu en iyi açıklayan bir numarayı daire içine alınız.)*

	Hiç rahatsız olmadım	Neredeyse hiç rahatsız olmadım	Çok az rahatsız oldum	Kısmen rahatsız oldum	Oldukça rahatsız oldum	Çok rahatsız oldum	Aşırı derecede rahatsız oldum
13. Atriyal fibrilasyonun her an başlayabileceğine dair endişe ve kaygı hissetmekten	1	2	3	4	5	6	7
14. Atriyal fibrilasyonun uzun vadede diğer sağlık sorunlarını olumsuz yönde etkileyebileceğine dair endişe yaşamaktan	1	2	3	4	5	6	7

1 ila 7 arasında derecelendirmeniz gerekirse, son 4 hafta içerisinde, atriyal fibrilasyon tedaviniz sonucunda aşağıda belirtilen endişe hallerinden ne ölçüde rahatsız oldunuz? *(Lütfen sizin durumunuzu en iyi açıklayan bir numarayı daire içine alınız)*

	Hiç rahatsız olmadım	Neredeyse hiç rahatsız olmadım	Çok az rahatsız oldum	Kısmen rahatsız oldum	Oldukça rahatsız oldum	Çok rahatsız oldum	Aşırı derecede rahatsız oldum
15. İlaç tedavisinin yan etkileri hakkında endişelenmekten	1	2	3	4	5	6	7
16. Kateter ile yakma, ameliyat veya kalp pili gibi prosedürlerin yan etkisi veya oluşturabileceği sorunlar hakkında endişelenmekten	1	2	3	4	5	6	7
17. Burun kanaması, diş fırçalarken oluşan diş eti kanaması, kesiklerden oluşan ağır kanama, veya berelenme gibi sonuçlara sebep olan kan sulandıran ilaçların yan etkisi hakkında endişelenmekten	1	2	3	4	5	6	7
18. Tedavinin günlük hayatınızı olumsuz yönde etkileyeceği konusunda kaygılanmaktan veya endişelenmekten	1	2	3	4	5	6	7

1 ila 7 arasında derecelendirmeniz gerekirse, sonuç olarak, şu anda tedavinize ilişkin olarak aşağıda belirtilen durumlardan ne ölçüde memnunsunuz? *(Lütfen sizin durumunuzu en iyi açıklayan bir numarayı daire içine alınız.)*

	Aşırı derecede memnunum	Çok memnunum	Oldukça memnunum	Memnun olmakla olmamak arasındayım	Oldukça memnuniyetsizim	Çok memnuniyetsizim	Aşırı derecede memnuniyetsizim
19. Şu anki tedaviniz Atriyal Fibrilasyonunuzu Kontrol altında tutuyor mu?	1	2	3	4	5	6	7
20. Tedaviniz Atriyal Fibrilasyon ile ilişkili yaşadığınız belirtileri ne ölçüde rahatlattı?	1	2	3	4	5	6	7

Appendix 2. English version of the AFEQT questionnaire

Atrial Fibrillation Effect on QualiTy-of-life (AFEQT) Questionnaire

Section 1. Occurrence of atrial fibrillation Name or ID:_____

Are you currently in atrial fibrillation? ☐ Yes ☐ No

If No, when was the last time you were aware of having had an episode of atrial fibrillation? (Please check one answer which best describes your situation)

__earlier today __1 month to 1 year ago

__within the past week __ more than 1 year ago

__within the past month __I was never aware of having

Section 2. The following questions refer to how atrial fibrillation affects your quality of life. On a scale of 1 to 7, over the past 4 weeks, as a result of your atrial fibrillation, how much were you bothered by: (Please circle one number which best describes your situation)

	Not at all bothered Or I did not have this symptom	Hardly bothered	A little Bothered	Moderately bothered	Quite a bit bothered	Very bothered	Extremely bothered
1. Palpitations: Heart fluttering, skipping or racing	1	2	3	4	5	6	7
2. Irregular heartbeat	1	2	3	4	5	6	7
3. A pause in heart activity	1	2	3	4	5	6	7
4. Lightheadedness or dizziness	1	2	3	4	5	6	7

On a scale of 1 to 7, over the past 4 weeks, have you been limited by your atrial fibrillation in your: (Please circle one number which best describes your situation)

	Not at all limited	Hardly limited	A little Limited	Moderately limited	Quite a bit limited	Very limited	Extremely limited
5. Ability to have recreational pastimes, sports, and hobbies	1	2	3	4	5	6	7
6. Ability to have a relationship and do things with friends and family	1	2	3	4	5	6	7

On a scale of 1 to 7, over the past 4 weeks, as a result of your atrial fibrillation, how much difficulty have you had in: (Please circle one number which best describes your situation)

	No difficulty at all	Hardly any difficulty	A little Difficulty	Moderate difficulty	Quite a bit of difficulty	A lot of difficulty	Extreme difficulty
7. Doing any activity because you felt tired, fatigued, or low on energy	1	2	3	4	5	6	7
8. Doing physical activity because of shortness of breath	1	2	3	4	5	6	7
9. Exercising	1	2	3	4	5	6	7
10. Walking briskly	1	2	3	4	5	6	7
11. Walking briskly uphill or carrying groceries or other items, up a flight of stairs without stopping	1	2	3	4	5	6	7
12. Doing vigorous activities such as lifting or moving heavy furniture, running, or participating in strenuous sports like tennis or racquetball	1	2	3	4	5	6	7

Atrial Fibrillation Effect on QualiTy-of-life (AFEQT) Questionnaire

	Not at all Bothered	Hardly bothered	A little bothered	Moderately bothered	Quite a bit bothered	Very bothered	Extremely bothered
13. Feeling worried or anxious that your atrial fibrillation can start anytime	1	2	3	4	5	6	7
14. Feeling worried that atrial fibrillation may worsen other medical conditions in the long run	1	2	3	4	5	6	7
On a scale of 1 to 7, over the past 4 weeks as a result of your atrial fibrillation, how much did the feelings below bother you? (Please circle one number which best describes your situation)							
	Not at all bothered	Hardly bothered	A little bothered	Moderately bothered	Quite a bit bothered	Very bothered	Extremely bothered
15. Worrying about the treatment side effects from medications	1	2	3	4	5	6	7
16. Worrying about complications or side effects from procedures like catheter ablation, surgery, or pacemakers therapy	1	2	3	4	5	6	7
17. Worrying about side effects of blood thinners such as nosebleeds, bleeding gums when brushing teeth, heavy bleeding from cuts, or bruising	1	2	3	4	5	6	7
18. Worrying or feeling anxious that your treatment interferes with your daily activities	1	2	3	4	5	6	7
On a scale of 1 to 7, over the past 4 weeks, as a result of your atrial fibrillation treatment, how much were you bothered by: (Please circle one number which best describes your situation)							
	Extremely satisfied	Very satisfied	Somewhat satisfied	Mixed with satisfied and dissatisfied	Somewhat dissatisfied	Very dissatisfied	Extremely dissatisfied
19. How well your current treatment controls your atrial fibrillation?	1	2	3	4	5	6	7
20. The extent to which treatment has relieved your symptoms of atrial fibrillation?	1	2	3	4	5	6	7
On a scale of 1 to 7, overall, how satisfied are you **at the present time** with: (Please circle one number which best describes your situation)							

Name or ID:_____