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HEALTH - RELATED QUALITY OF LIFE IN PATIENTS WITH ATRIAL FIBRILLATION

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VILNIAUS UNIVERSITETAS

VAIVA KARPAVIČIENĖ

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ABBREVIATIONS

AF – atrial fibrillation

AP – angina pectoris

CHD – coronary heart disease

ES – emotional state

EHRA – Europien Heart Rythm Assotiation

EKG - electrocardiogram

GHP – general health perception

HC – health change

HF – heart failure

INR – international normalized ratio

MH – mental health (general)

MI – miocardial infarction

NYHA – New York Heart Association

P – pain

PF – physical functioning

QoL – quality of life

RE - role limitations due to emotional health problems

RP – role limitations due to physical health problems PH – physical health (general)

SAP – stabile angina pectoris

SD – standart deviation

SF – social functioning

SOC – sence of coherence

UAP –unstabile angina pectoris

VT – vitality

INTRODUCTION

Cardiovascular diseases during the last decade have become the main cause of death all around the world including Lithuania and all European countries as well. According to the data of Institute of Hygiene of Lithuania the amount of deaths caused by diseases of blood circulation system comprised 64,9 % among women and 47,0 % among men in 2014 – prevalence of cardiovascular system diseases is obvious and comprise the major part.

Despite of the most advanced diagnostic and treatment measures, the incidence of cardiovascular diseases in Lithuania is growing rapidly. Mortality rate of population for CHD, stroke is one of the largest in Europe, cardiovascular morbidity and mortality rates are almost 2-3 times worse than the European Union average. Often deaths of working-age eager people are apparent, many patients with such diagnosis remain disabled.

Atrial Fibrillation (AF) is the most common long-term arrhythmia that increases the mortality twice, risk of stroke, worsens the quality of life (QoL) and reduces the physical functioning, patients are more often hospitalized. Related results of AF treatment are side effect of medicament treatment, medical interventions, frequent hospitalizations which influence significantly the QoL. Studies carried out during the past decade indicate that recovery of sinus rhythm or normosystolyc form of AF does not, unfortunately, always increase QoL. According to the AF treatment recommendations the main indicators of obvious treatment performance are not only clinical symptom reduction but improvement of QoL as well. Scientists invite to carry out as many researches as it is possible in order to successfully identify factors that influence QoL of patients who suffer from AF.

Evaluation of QoL becomes important in relation to other factors as well in the area of cardiology. First of all, in clinical practice the opinion of patient regarding the treatment method becomes as well important not only that of doctor. According to the recommendations of American Heart Association issued in 2014 treatment strategy (rhythm or rate control, anticoagulation treatment) of permanent AF is influence by the choice of a patient correspondingly to his/her evaluation of QoL. Secondly, researchers and pharmaceutical companies include the QoL assessment as a separate outcome evaluation criteria during clinical trials. Furthermore, the survey of QoL is important for disease risk prediction and its control. After analysis of questionnaires of QoL filled in by the patients it is easier to evaluate the risk of disease, results of treatment and the patient's expectations as well as to create an optimal heath service plan.

An important research area becomes intercultural comparison of QoL. The majority of QoL questionnaires is issued in the English language, therefore cultural-linguistic adaptation without deviation in questionnaire content, concept, and logical structure as well as validity in different countries or cultures is important.

General QoL is a broad term including all life spheres and describing individual functional status. It is related to a person's aims, expectations, quality standards and interests. Health-related QoL is a part of general QoL which is significantly influenced by personal health and health care. Health-related QoL reflects the patient's subjective assessment of his/her own health as an essential aspect of health relationship. It as well reveals how people perceive and respond to their state of health and health-related sensations such as physic, functional, emotional and psychological well-being.

Researches of health-related QoL has a great importance as they help to assess the effectiveness of treatment and other health care measures, to evaluate programs of health improvement and disease prophylaxis. They are useful for assessing the state of public health and monitoring the dynamics of the development of state health policy.

It is highly important to assess factors of sociodemographic, medical and those of patients (sense of coherence) that may affect the better quality of life. Sense of coherence is a way of seeing the world that facilitates successful coping with stressors.

THE AIM AND TASKS OF THE STUDY

The aim of the study is to investigate health related quality of life of atrial fibrillation patients according to sociodemographic, medical factors and sense of coherence.

Tasks of the study:
1. To perform cultural-linguistic validation of disease-specific quality of life questionnaire AF-QoL for patients with atrial fibrillation in Lithuania.
2. To evaluate health-related quality of life of patients with atrial fibrillation using general and disease-specific questionnaires SF-36 and AF-QoL.
3. To investigate health-related quality of life of patients with atrial fibrillation according to sociodemographic (gender, age, education, income, marital status) and medical (duration, type, symptom class of atrial fibrillation, comorbidities) factors.
4. To evaluate sense of coherence of patients with atrial fibrillation using questionnaire of sense of coherence SOC-13.
5. To investigate sense of coherence of patients with atrial fibrillation according to sociodemographic (gender, age, education, income, marital status) and medical (duration, type, symptom class of atrial fibrillation, comorbidities) factors.
6. To evaluate relationship between health-related quality of life and sense of coherence of patients with atrial fibrillation.

SCIENTIFIC NOVELTY OF THE STUDY

The research carried out for investigation of health-related QoL of in patients with AF was performed for the first time in Lithuania using the generic QoL questionnaire

SF-36 and disease specific AF-QoL questionnaire. It was the first study which involved influential factors of sociodemographic and medical areas in relation to QoL of patients with AF. Sense of coherence of patients was analyzed for the first time including its interference with sociodemographic and medical factors. The patients evaluated comprised the age group of 50-70. Attention should be drawn to the fact that the majority of studies carried out previously and related to cardiovascular pathology assessment and its influence to QoL is focused on elder patients regardless of a circumstance that results in negative influence to QoL because of more frequent poliorganic pathology.

In collaboration with the authors of the disease-specific AF-QoL questionnaire, the linguistic / cultural adaptation procedure was performed in order to make it suitable for Lithuanian patients which was approved for QoL assessment of people who suffer from AF. Copyright permission to use the questionnaire for academic and practical purposes was received. A detailed description of the linguistic / intercultural adaptation process was done. Up to now there is no one specific protocol for this work, therefore, in the scientific literature it is recommended to describe in detail each performed validation process in order other researchers could use this experience.

The generic QoL of questionnaire SF-36 was used in this study as well which allowed to compare the data of QoL of patients with AF with the results of other author studies in different populations.

The research carried out allows more insights into disease and sociodemographic factors that affect the QoL. The results obtained may be used in everyday clinical practice choosing the treatment strategy, including antitrombotic treatment (novel oral anticoagulants ws Warfarin, control of INR, management of heart rhythm and rate), analyzing side effects of medicines as well as factors associated with hospitalization frequency.

The results of the study can be used in Lithuanian and European Union health policy, in health care improvement strategies, in creation of long-term surveillance programs, disease prevention programs with particular emphasis on influential factors of economical status and education towards QoL; in decisions of medicines availability and compensation issues; in promotion of researches and their funding; in implementation of QoL survey instruments in different countries from the point of view of linguistic and cultural distinctions.

After the publication of scientific article in journal "Medical Theory and Practice" interest in access to disease-specific AF-QoL questionnaire was expressed by Vilnius University as well as by scientists of Cardiology clinics of Lithuanian University of Health Sciences.

MATERIALS AND METHODS

Target Population

The study was performed in departments of Cardiology, Internal Diseases and Nephrology in Clinic of Internal disease in Vilnius City Clinical Hospital. The target population was patients with AF hospitalized in Vilnius City Clinical Hospital. Cross-sectional study was carried out during a limited period and communication was performed with the majority of in-hospital patients with AF. The target population was decreased significantly because part of patients were not able to communicate in Lithuanian. The research was comprised out of 229 respondents: 130 men (56 percent) and 99 women (43,2 percent) with mean age of 62,3±6,35 years old.

Inclusion criteria:
- Patients able to communicate and with agreement to participate in study;
- Age group 50 – 70 years;
- AF patients independently of duration of AF when diagnosis of AF is confirmed by ECG;

Exclusion criteria:
- Age until 50 and up 70 years;
- Patients who are not able to communicate and / or do not understand Lithuanian;
- Haemodinamicly unstable patients.

Research Methods

The study conducted a survey using two questionnaires on QoL and a SOC to explore. Sociodemographic and part of the medical data was obtained using data collection protocol prepared by us. Medical data was assessed by using a clinical investigation, medical history and medical documentation. Traditional methods of descriptive and inferential statistics were used for statistical analysis.

Research Procedure

The survey was conducted in accordance with the sociological - medical research professional ethics. Before a written consent to participate in the study, the patient were informed about biomedical research, its plan, methods, data manager. If a patient agreed to participate in the study, he/she signed a *Form of Consent of a Person informed.*

Patients were interviewed once by presenting questionnaire comprised out of four parts: questions on sociodemographic data, generic QoL questionnaire SF-36, disease-specific QoL questionnaire AF-QoL and sence of coherence questionnaire SOC-13. QoL questionnaires SF-36 and AF-QoL, sence of coherence questionnaire SOC-13 as well as data collection protocol prepared by us were self-administered. Target patients filled in the questionnaires by theirselves which were checked. In case any of questions were not clear and were not filled in patients were assisted by the researcher. 30 respondents indicated that they do not have sexual relations therefore, for the further study 199

questionnaires filled in fully and 30 questionnaires filled in partly (without questions 15, 16, 17 answered) were presented. Information about atrial fibrillation and comorbidities (hear failure NYHA functional class, EHRA symptoms class, etc.) was received from medical documentation.

Research on Quality of Life

To evaluate QoL in patients with AF two questionnaires were used: generic – SF-36 and disease-specific – AF-QoL.

Medical Outcome Study Short – Form Health Survey (**SF-36**). The SF-36 is the most widely validated generic instrument available and has been used to study a great variety of cardiac and non-cardiac conditions. The SF-36 consists of a 36 item questionnaire that assesses eight health concepts: general health perception, physical functioning, social functioning, role limitations due to physical or emotional problems, bodily pain, mental health and vitality. In addition to these eight subscales, the SF-36 also generates physical and mental component summary scores. The SF-36 evaluates well-being of the last four weeks. For the evaluation of each field question were used and answers to the questions were assessed in points, which sum can range from 0 to 100 points, The higher number of the points, the better is QoL. The cultural/linquistic validation procedure in Lithuania of SF-36 has been performed in 2001 in patients with rheumathoid artritis.

Disease-specific AF-QoL questionnaire is an 18-item questionnaire with three domains: psychological, physical and sexual activity. The psychological domain includes seven items, the physical – eight items, the sexual activity domain – three items. The questions refer to the previous month; answers are of five point Likert scale („totally agree", „sufficiently agree", „neither agree nor disagree", „sufficiently disagree", and „totally disagree"). The AF-QoL is scored between 0 (worst QoL) and 100 (best QoL). The scores of domains were calculated using specific formula.

Research on Sense of Coherence

Sense of coherence was assessed with the 13-item version of the sense of coherence questionnaire (SOC-13). It has been used in many general population studies, in groups of patients affected by different illnesses and in many public health sectors. The validity of Lithuanian version of SOC-13 was confirmed with patients suffered from cancer. Three components are measured: c*omprehensibility (*questions 2, 6, 8, 9, 11), *manageability (*questions 3, 5, 10, 13) and *meaningfulness* (questions 1, 4, 7, 12). Each question has five variants of answer. A higher SOC score indicates better capacity to respond adequately to stress-full situations. Low sum of points indicates low level of SOC. As all answers to each question were encoded between 1 and 5, the general score points could differ between 13 and 65. We divided SOC assessment into three levels - low (13 - 30 points), medium (31- 48 points) and high (49 - 65 points.).

Analysis of Sociodemographic Characteristics of Respondents

Sociodemographic characteristics were assessed using questionnaire created by researcher. According to **age**, four groups were formed: 50 - 55 years old, 56 - 60 years old, 61 – 65 years old and 66 - 70 years old. According to **education** three groups were formed: I - elementary, incomplete secondary, secondary; II – vocational, III - higher/incomplete higher education. Data about **marital status** was divided into two groups: married (including unregistered marriage) and single (divorced, widows, spouses living in separate). The question related to monthly family **income** presented four answer variants: 145-290 eur (500-1000 Lt), 290 – 435 eur (1000 - 1500 Lt), 435 – 580 eur (1500 - 2000 Lt), and > 580 eur (> 2000 Lt). In the further analysis answers were studied taking into account the division by litas (LT) as it was official currency in Lithuania at the time of study.

Patient distribution according to age, gender, education, marital status, family income is presented in table 1 below.

Table 1. Sociodemographic characteristics of patients with atrial fibrillation.

Variables		Absolute number	%
Gender	Female	99	43,2
	Male	130	56,8
Age	50 - 55 y.o.	43	18,8
	56 - 60 y.o.	42	18,3
	61 - 65 y.o.	49	21,4
	66 - 70 y.o.	95	41,5
Education	Elementary, incomplete secondary, secondary	77	33,6
	Vocational	53	23,1
	Higher/incomplete higher education	99	43,2
Marital status	Married	158	69,0
	Single	71	31,0
Income per month	145-290 eur (500-1000Lt)	63	27,5
	290-435 eur (1000-1500Lt)	37	16,2
	435-580 eur (1500-2000Lt)	60	26,2
	>580 eur (>2000Lt)	69	30,1

Dividing patients into age groups by each five years it was defined that age group of more than 65 years old patients comprised the majority of respondents – 95 while other age groups comprised 40 respondents on average. This data proofs that AF prevalence is bigger among patients up 65 years old and smaller among patients under 65 years old. It was determined that the bigger proportion of respondents was with higher than secondary education (66,3 percent), married (69,0 percent) and with monthly income higher than 435 eur (56,3 percent).

Analysis of Clinical Characteristics of Respondents

Clinical characteristics of respondents were assessed using data from clinical investigation, medical documentation and of part of researches-made questionnaire of sociodemographic characteristics where duration of AF was described.

According to the reviewed answers about **duration of AF** five groups were formed: duration of AF < 0,5 years, 0,5 – 1 year, 5 – 10 years and > 10 years.

According to **type of AF** three types were set: paroxysmal, persistent and permanent. It was found that 196 patients had tachysistolic form of AF. The evaluation of uneven distribution was done and the attention was paid to the facts that AF is not divided into such forms in any foreign article related to "Quality of Life with AF". Therefore, the present study excludes the above mentioned differentiation.

In addition, the research included data on **EHRA** symptom class of AF (EHRA I – 'No symptoms', EHRA II – 'Mild symptoms', normal daily activity not affected, EHRA III – 'Severe symptoms', normal daily activity affected, EHRA IV – 'Disabling symptoms', normal daily activity discontinued). In further statistical analysis, considering respondent account, EHRA II and EHRA III patients were analyzed. There were only 7 patients of EHRA I class and 8 patients of EHRA IV class.

Clinical data of atrial fibrillation is shown in table 2. It was determined that the higher proportion of AF patients have paroxyzmal or persistent AF (76 percent) with less than five years duration and EHRA III symptom class of AF.

Table 2. Clinical data of atrial fibrillation.

Variables		Absolute number	%
Duration of atrial fibrillation (in years)	< 0,5 y.	60	26,2
	0,5 - 1 y.	28	12,2
	1-5 y.	86	37,6
	5-10 y.	38	16,6
	>10 y.	17	7,4
Type of atrial fibrillation	Paroxysmal	78	34,1
	Persistent	116	50,7
	Permanent	35	15,3
EHRA symptoms class	I	8	3,5
	II	66	28,8
	III	148	64,6
	IV	7	3,1

EHRA– European Heart Rate Association

The most common comorbidities of our patients with AF are shown in table 3 below. Arterial hypertension, heart failure, coronary heart disease, diabetes mellitus, thydoid dysfynction, obesity are assigned to disease which affect AF appearance or provoke its progress. The majority of respondents were diagnosed with arterial hypertension (87,8 percent) and heart failure of II - III NYHA functional class (88,2

percent), a considerable part of patients - angina pectoris (49,8 proc.). remaining comorbidities did not comprise more than 20 percent, thus, they were excluded from the further analysis in order to avoid inaccuracy. Statistical calculations were made only among patients of II and III NYHA functional class as only 8 respondents belonged to I functional class and 4 – to IV functional class.

Table 3. Comorbidities of patients with atrial fibrillation

Disease	Yes		No	
	Number	%	Number	%
Arterial hypertension	201	87,8	28	12,2
Stabile angina pectoris	35	15,3	194	84,7
Unstable angina pectoris	79	34,5	150	65,5
Miocardial infarction	20	8,7	209	91,3
Heart failure	214	93,0	15	7,0
NYHA – I	8	3,5		
NYHA – II	144	62,9		
NYHA – III	58	25,3		
NYHA - IV	4	1,7		
Lung diseases	45	19,7	184	80,3
Diabetes mellitus	36	15,7	193	84,3
Insufficiency of bloodstream of brain	22	9,6	207	90,4
Thyroid pathology	34	14,8	195	85,2
Obesity	29	12,6	200	87,3
Other diseases	19	8,3	210	91,7

NYHA – *New York Heart Association*

Linguistic-Cultural Validation Process of Questionnaire AF-QoL

After analysis of scientific literature it was determined that up to now there were no confirmed and validated disease-specific QoL questionnaire for patients suffering from AF in Lithuania. Therefore, it was aimed to choose and validate QoL questionnaire enabling a more detailed assessment of QoL of the Lithuanian population with AF.

At the beginning of research the questionnaires related to health-related QoL were analysed which were devoted to heart and cardiovascular diseases - *Quality of life index: Cardiac version, Minnesota Living with Heart Failure Questionnaire, Arrythmia Syndrome scale, Quality of Life of Atrial Fibrillation Scale* etc., among them only three questionnaires were focused on AF - *Atrial Fibrillation Quality of Life (AF-QoL) questionnaire, the QoL in AF (QLAF) questionnaire, and the Quality of Life of Atrial Fibrillation (AFQLQ) questionnaire*). Letters asking for cooperation were sent to all questionnaire authors, however, the reply was received only from AF-QoL questionnaire authors. It is important to manage author cooperation in order to carry out a full and proper questionnaire adaptation in another country

Upon consent of cooperation mentioned above linguistic-cultural validation process of health-related questionnaire AF-QoL devoted to patients with AF was performed in Lithuania which was divided into several stages. The authors of the questionnaires permitted to translate the questionnaire using Lithuanian translation bureau services taking into account prior evaluation of translators (Curriculum vitae were assessed). Instructions for validation process were presented by questionnaire authors.

In the first stage, two professional translators whose native language is Lithuanian translated the questionnaire from the Spanish (Original language) into Lithuanian. Then both translations were assessed and one final version of Lithuanian questionnaire was presented. This version was submitted to translator whose native language is Spanish and has excellent knowledge of Lithuanian language who did a back-translation to the Spanish language. Upon the receipt of the questionnaire in Spanish language the translation was sent to original questionnaire authors who in cooperation with translator discussed each question and chose the most appropriate variants, phrases, words in order they would be totally clear, coherent and would not change question meaning and essence. This procedure allowed to adjust the correct Lithuanian version of the questionnaire.

In the further stage, ten Lithuanian patients were tested (questionnaire authors indicate to test 5-10 patients). Authors of the questionnaire presented a detailed testing plan. The testing should be performed in order to avoid misunderstandings in linguistic-cultural aspects including clarity, readability and suitability assessment. The main goal of the test-interview was to identify words or questions which cause doubt or uncertainty, offer changes for vague terms if any. Questionnaire title, structure (number of questions and answers) cannot be changed and only question formulation may be amended. Questionnaires of test-interview filled in were presented.

The Cronbach alfa of questionnaire AF-QoL Lithuanian version is 0,913 (psychological domain – 0,89, physical – 0,841, sexual activity - 0,798), which proofs proper questionnaire validity and suitability. Authors presented their permission to use health-related questionnaire AF-QoL in Lithuania for non-commercial purposes for free.

Statistical analysis of data

The data was analysed by means of "SPSS" (Statistical Package for Social Sciences), Version 20. Descriptive statistics of variables were calculated for the primary general data analysis: general distributions, frequency tables, the mean values, and standard deviations.

Cronbach's alpha coefficient was calculated in order to assess reliability of the questionnaire scale. It is considered that the coefficient value of a well-prepared questionnaire should exceed 0.7 (according to some authors it should exceed 0.6).

Spearman's correlation rank coefficient was calculated for assessment of relations between variables (significance levels of $p<0.05$ and $p<0.01$).

Chi-square criterion (χ^2) with the selected significance level p<0.05 was used for assessment of differences of qualitative data among individual groups of respondents.

Student's t-criterion for independent scopes and its non-parametric analogue, i.e. Mann-Whitney criterion, were used for assessment of differences between two independent groups of respondents. In case of more than two groups of respondents, differences among them were assessed by using ANOVA model and non-parametric statistics, i.e. Kruskal-Wallis rank criterion for independent scopes. In case of applying ANOVA model, Tukey HSD and Bonferroni criteria were used for comparison of three and more dependent scopes. Dispersion equality was verified by using Levene's criterion. Differences were considered to be significant in terms of statistics when the calculated significance level was p<0.05.

A cumulative distribution function was used to reflect on the questionnaire on quality of life AF-QoL among various groups of respondents. A cumulative distribution function is a function with the right side of which indicating probability that a random variable **X** takes values less than or equal to x.

$F_X(x)=P (X \leq x)$

A regression model was used in order to assess the impact of independent variables (social-economic factors, clinical features of atrial fibrillation, comorbidities) on the QoL (assessment by means of questionnaire AF-QoL). Based on the data available in scientific readings we found that binary logistic regression was best in this case. We used this regression model to describe respondents whose predicted QoL was among half (median) or a quarter (third quartile), or three quarters of those whose QoL was the best. We selected the projected value of a variable (quartile) by taking into consideration the variable that regression model suited best. A model is suitable, if:

- Probability ratio criterion: p is 0.05
- For all regressors Wold's criterion: p is 0.05
- Coefficient signs do not seem illogical
- No less than 50 percent of cases are classified correctly, when Y=1 and when Y=0
- Hosmer-Lemeshow criterion: p≥0.05
- Cook's measurements of all subjects are ≤1 and all DFbeta ≤1
- The selected determination coefficient is ≥0.2.

The results of the data analysis of the research are provided in charts and tables.

RESULTS

General evaluation of QoL in patients with atrial fibrillation

The average score of QoL is shown in tables 4 and 6. AF patients are characterized by poor QoL. AF-QoL average score of global QoL is 32.21. By means of using questionnaire SF-36 it was found that the average score of general physical health was 43.79, in case of mental health it was 44.15. Lower results of the physical domain

were showed by both questionnaires. A lower average score of QoL was in the women's group (Table 5, 7).

Table 4. Average quality of life of all respondents with atrial fibrillation (AF-QoL)

Domains of AF-QoL	Number	Min points	Max points	Average	Standard deviation
Psychological	229	0	100	**31.77**	26.320
Physical	229	0	94	**32.59**	23.944
Sexual activity	199	0	100	**40.81**	30.653
Global QoL	229	0	97	**32.21**	21.922

Table 5. Average quality of life of males and females with atrial fibrillation (AF-QoL)

Domains of AF-QoL	Number	Average mean of QoL		
		General	Males	Females
Psychological	229	31.77	**35.25**	**27.21**
Physical	229	32.59	**34.92**	**29.53**
Sexual activity	199	40.81	**39.78**	**42.75**
Global QoL	229	32.21	**35.78**	**27.52**

Table 6. Average quality of life of all respondents with atrial fibrillation (SF-36)

Domains of SF-36	Number	Min points	Max points	Average	Standard deviation
Physical functioning	229	0	100	**58.19**	24.706
Role limitations due to physical health problems	229	0	100	**36.35**	37.637
Pain	229	0	100	**61.81**	26.596
General health perception	229	0	95	**40.66**	17.678
Vitality	229	5	100	**52.42**	19.822
Social functioning	229	0	100	**63.64**	26.856
Role limitations due to emotional health problems	229	0	100	**46.15**	40.170
Emotional state	229	12	100	**62.54**	18.654
Health change	229	0	100	**30.79**	22.625
Physical health (general)	229	19	69	**43.79**	9.627
Mental health (general)	229	18	67	**44.15**	10.287

Table 7. Average quality of life of males and females with atrial fibrillation (SF-36)

Domains of SF-36	Number	Average mean of QoL		
		General	Males	Females
Physical functioning	229	58.19	**63.69**	**50.96**
Role limitations due to physical health problems	229	36.35	**40.77**	**30.56**
Pain	229	61.81	**64.02**	**58.90**
General health perception	229	40.66	**42.19**	**38.64**
Vitality	229	52.42	**54.31**	**49.95**
Social functioning	229	63.64	**66.81**	**59.48**
Role limitations due to emotional health problems	229	46.15	**49.00**	**42.41**
Emotional state	229	62.54	**64.22**	**60.33**
Health change	229	30.79	**32.88**	**28.03**
Physical health (general)	229	43.79	**45.57**	**41.44**
Mental health (general)	229	44.15	**45.39**	**42.52**

Relation between social-demographical characteristics and QoL of AF patients

The relation between health-related QoL and social-demographic factors of AF patients, such as gender, age, education, average income of the family, and marital status, were analysed. Different statistical calculations were applied depending on the scope and the type of data. In some cases we applied several criteria for assessment of the same features so that we could comprehensively verify the hypotheses (conclusions) and to determine the most suitable calculation method.

A non-parametric Mann-Whitney U-test was performed in order to assess differences between males and females. A statistically significant difference was found in AF-QoL psychological and global domains of QoL (Table 8) by way of comparing mean ranks. Women evaluated QoL with lower scores than men. Only the domain of sexual activity was ranked higher, but this could result from lower standards applied to sexual activity in this age (the majority of questionnaires with questions on sexual activity left unanswered were returned by women claiming that they were not sexually active).

Table 8. Index of QoL of patients with atrial fibrillation based on gender (AF-QoL)

Gender	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
Females	101.38	106.59	102.44	99.13
Males	125.37	121.40	98.70	127.09
p *	**0.007**	0.093	0.661	**0.002**

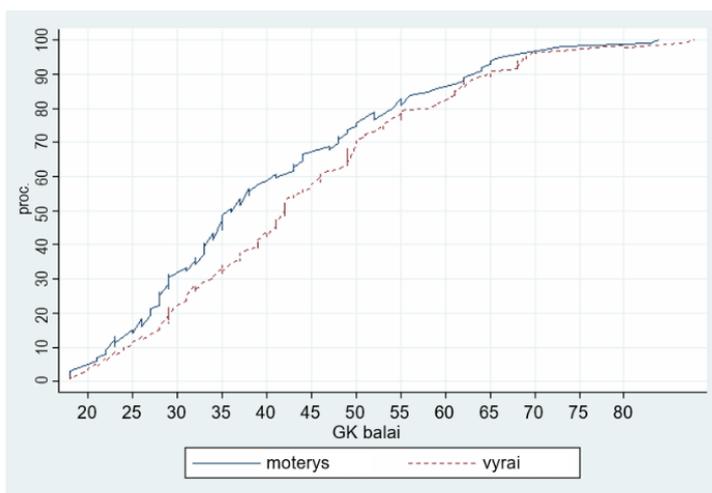*Mann-Whitney cr.*, mean ranks are compared.

By way of assessment of the mean ranks based on SF-36 questionnaire, it was found, that women tend to rank QoL with lower scores than men, but a statistically significant difference was found in FA, PH, and MH domains (Table 9).

Table 9. Index of QoL of patients with atrial fibrillation based on gender (SF-36)

Gender	Domains of SF-36										
	FA	RP	P	GHP	VT	SF	RE	ES	HC	PH	MH
Females	95.6	106.0	106.9	107.4	106.4	105.3	109.2	105.6	107.3	98.25	103.6
Males	129.7	121.8	121.1	120.7	121.5	122.3	119.4	121.2	120.8	127.7	123.6
p *	**0.000**	0.063	0.107	0.133	0.087	0.052	0.231	0.076	0.106	**0.001**	**0.023**

* *Mann-Whitney cr.*, mean ranks are compared. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general)

Detailed QoL scores among men and women based on Questionnaire AF-QoL are provided in the form of cumulative distribution curves (Fig. 1). It can be seen that 60 percent of women rated QoL as being under 40 points, meanwhile in the group of males the aforementioned index was just 40 percent, indicating that a higher percentage of females gave lower scores in terms of QoL.

Fig. 1. Distribution of quality of life scores between males and females (AF-QoL)
(moterys-women, vyrai-men, GK-balai- QoL score)

Distribution of social-demographical characteristics was assessed in order to determine the reasons why women assessed QoL more negatively (Table 10). It was found that statistically significant part of women was elder, single, and had lower income. There were no statistically significant differences between men and women based on heart failure and EHRA symptom class.

Table 10. Distribution between males and females based on sociodemographic and clinic factors

Variables		Females	Males	p
Age	50 - 55 y.	11(11.1%)	32(24.6%)	
	56 - 60 y.	12(12.1%)	30(23.1%)	
	61 - 65 y.	21(21.2%)	28(21.5%)	**0.001**
	66 - 70 y.	55(55.6%)	40(30.8%)	
Education	Elementary, incomplete secondary, secondary	33(33.3%)	44(33.8%)	
	Vocational	24(24.2%)	29(22.3%)	0.941
	Higher/incomplete higher	42(42.4%)	57(43.8%)	
Marital status	Married	52(52.5%)	106(81.5%)	**0.000**
	Single	47(47.5%)	24(18.5%)	
Income per month	145 – 290 eur (500-1000 Lt)	45(45.5%)	18(13.8%)	**0.000**
	290 – 435 eur (1000-1500 Lt)	12(12.1%)	25(19.2%)	
	435 – 580 eur (1500-2000 Lt)	20(20.2%)	40(30.8%)	
	> 580 eur (> 2000 Lt)	22(22.2%)	47(36.2%)	
NYHA functional class	I	3 (3.3%)	3 (2.5%)	
	II	63 (69.2%)	81 (66.9%)	0.366
	III	25 (27.5%)	33 (27.3%)	
	IV	0(0.0%)	4(3.3%)	
EHRA symptoms class	I	6 (99.1%)	4(3.1%)	
	II	28(28.3%)	39(30.0%)	0.512
	III	63(63.6%)	81(62.3%)	
	IV	2(2.0%)	6(4.6%)	

NYHA– New York Heart Association, EHRA– European Heart Rhythm Association

Kruskal-Walis test was used in order to evaluate the relation between QoL and **age**. No statistically significant differences of AF-QoL scores between age groups were found (Table 11). A statistically significant difference was identified in the area of general health assessment based on the results of SF-36 questionnaire (Table 12): patients at the age of 61- 65 ranked QoL with the lowest scores, however, no statistically

significant difference was identified in the areas of the general physical and psychological in terms of QoL assessment.

Assessment of SF-36 QoL scores according to age groups showed a statistically significant difference only in the GHP domain, but there were no differences in the general physical and mental health domains (Table 12).

Table 11. Index of QoL of patients with atrial fibrillation based on age (AF-QoL)

Age	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
50 – 55 y.	128.87	119.80	109.49	131.19
56 – 60 y.	114.50	125.42	103.35	121.26
61 – 65 y.	117.90	110.26	82.21	110.74
66 – 70 y.	107.45	110.67	104.02	107.10
p *	0.358	0.588	0.10	0.212

Kruskal-Wallis cr., mean ranks are compared.

Table 12. Index of QoL of patients with atrial fibrillation based on age (Questionnaire SF-36)

Age	Domains of SF-36										
	FA	RP	P	GHP	VT	SF	RE	ES	HC	PH	MH
50 – 55 y.	117.8	109.6	106.9	130.5	113.9	115.3	126.4	114.3	108.4	119.2	116.8
56 – 60 y.	117.2	121.6	132.4	135.6	114.7	121.7	99.98	121.8	126.1	127.4	118.0
61 – 65 y.	112.1	110.1	115.2	99.27	113.7	113.2	122.2	114.1	109.1	107.8	115.2
66 – 70 y.	114.1	116.9	110.7	106.9	116.2	112.7	112.7	111.5	116.0	111.2	112.6
p *	0.937	0.764	0.26	**0.014**	0.996	0.900	0.216	0.871	0.525	0.469	0.971

Kruskal-Wallis cr., mean ranks are compared. FA - Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general)

In addition to this, we also used ANOVA model for assessment of the impact of age on analysis to see whether the mean differences between independent groups of respondents were statistically significant, in order to check the credibility of the conclusions made. We found that the indicators derived from AF-QoL questionnaire depending on age groups were not statistically significant (p values of all indicators exceeded 0.05). Upon analysis of the results of SF-36 from the point of view of the QoL, a statistically significant difference was identified in the area of general health assessment (F=3.409, p=0.018). We applied Tukey HSD *post hoc* criterion in order to identify the groups characteristic of the biggest and the most significant differences. Calculations indicate that the biggest mean differences were between age groups of 56-60 and 61-65 as well as between age groups of 56-60 and 66-70.

Upon analysis of the impact of **education**, a statistically significant difference was identified in all domains of AF-QoL questionnaire by means of applying the Kruskal-Wallis criterion (Table 13). Comparison of the mean ranks showed that
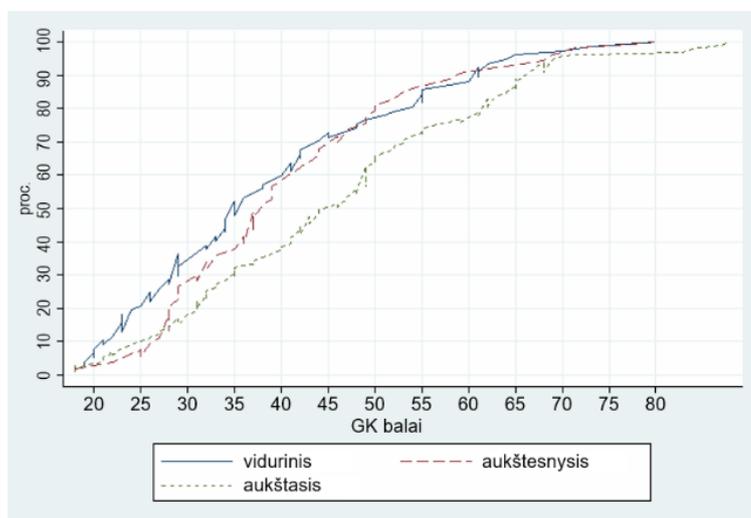
respondents with incomplete higher education and higher education assessed QoL with higher scores in all domains.

Table 13. Indices of QoL of patients with atrial fibrillation based on education (AF-QoL)

Education	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
Elementary, incomplete secondary, secondary	98.84	105.33	84.10	98.87
Vocational	111.28	103.73	104.72	107.33
Higher/incomplete higher education	129.59	128.56	109.41	131.65
p *	**0.008**	**0.025**	**0.02**	**0.003**

Kruskal-Wallis cr., mean ranks are compared.

Detailed differences in terms of the QoL assessment scores among people with different levels of education based on a AF-QoL questionnair are specified on the cumulative distribution curves (Fig. 2). Here we can see that 40 percent of the respondents with higher education ranked the QoL with up to 40 points, whereas in the group of people with a lower education level this rank was 60 percent. This shows that the bigger portion of respondents with a lower education level gave lower scores in terms of QoL assessment.

Fig. 2. Distribution of quality of life assessment scores based on education (AF-QoL)
(vidurinis – secondary, aukštasis – higher, aukštesnysis – vocational, GK balai – QoL score)

Using SF-36 questionnaire, comparison of the mean ranks has shown statistically reliable data that subjects with incomplete higher education and higher education gave higher scores in terms of QoL in the areas of PF, RP, RE, P and general physical health (Table 14). The level of education had no impact on assessment of the general mental health.

Table 14. Indices of QoL of patients with atrial fibrillation based on education (SF-36)

Education	Domains of SF-36										
	FA	RP	P	GHP	VT	SF	RE	ES	HC	PH	MH
Elementary ,incomplete secondary, secondary	109.9	113.5	108.8	105.5	113.9	110.0	112.9	108.4	102.8	108.3	112.0
Vocational	99.00	93.14	100.7	112.3	97.76	105.3	99.32	104.9	115.4	97.38	99.64
Higher/inc omplete higher education	127.5	127.8	127.3	123.7	125.0	124.0	124.9	124.4	124.2	129.6	125.5
p *	**0.029**	**0.005**	**0.035**	0.182	0.051	0.178	0.057	0.136	0.082	**0.009**	0.064

Kruskal-Wallis cr., mean ranks are compared. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general)

Analysis of the impact of the mean **income** earned by the family per month on QoL based on the Kruskal-Wallis criterion has shown statistically significant differences in all domains of AF-QoL questionnaire (Table 15). Comparison of the mean ranking revealed that respondents whose families' monthly income amounted to >580 eur or more on average tended to rank the QoL with higher scores. Respective results have been obtained in SF-36 questionnaire (Table 16). Statistical reliability of difference among the mean values in terms of assessment of QoL depending on income during analysis of questionnaires AF-QoL and SF-36 was verified by applying the ANOVA model.

Table 15. Indices of QoL of patients with AF based on income (AF-QoL)

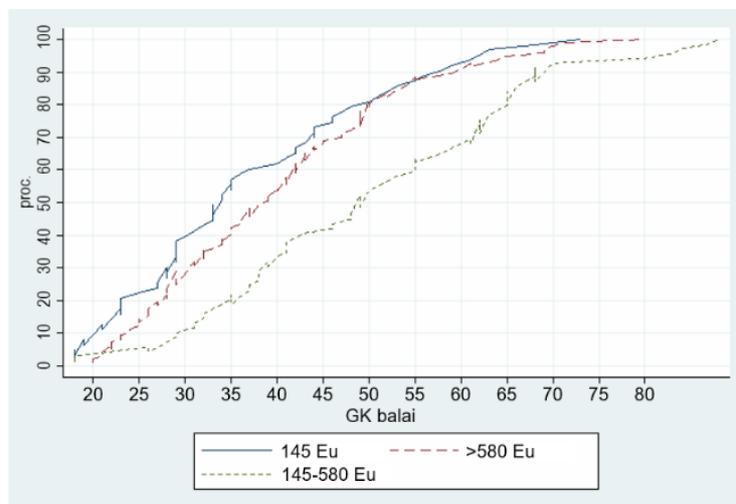| Income	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
145 – 290 eur (500-1000 Lt)	90.87	92.55	88.12	83.69
290 – 435 eur (1000-1500 Lt)	124.39	99.92	96.60	115.72
435 – 580 eur (1500-2000 Lt)	105.57	111.17	85.21	108.02
> 580 eur (> 2000 Lt)	140.20	146.90	121.78	149.28
p *	**0.000**	**0.000**	**0.002**	**0.000**

Kruskal-Wallis cr., mean ranks are compared.

Table 16. Indices of QoL of patients with AF based on income (SF-36)

Income	Domains of SF-36										
	FA	**RP**	**P**	**GHP**	**VT**	**SF**	**RE**	**ES**	**HC**	**PH**	**MH**
145 – 290 eur (500-1000 Lt)	80.51	103.11	106.45	92.21	87.56	88.40	101.84	89.22	99.10	83.39	84.56
290 – 435 eur (1000-1500 Lt)	106.5	99.04	97.41	110.0	94.12	110.0	106.0	106.9	99.14	103.3	103.5
435 – 580 eur (1500-2000 Lt)	117.3	110.9	98.08	101.4	118.3	108.3	113.4	115.9	113.3	107.9	116.2
> 580 eur (> 2000 Lt)	148.9	137.9	146.9	150.2	148.31	147.7	133.2	140.7	139.4	156.2	147.8
p *	**0.000**	**0.003**	**0.000**	**0.000**	**0.000**	**0.000**	**0.028**	**0.000**	**0.001**	**0.000**	**0.000**

Kruskal-Wallis cr., mean ranks are compared. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general)

Detailed differences in terms of the QoL assessment scores among groups of people with different income based on questionnaires AF-QoL and SF-36 are specified on the cumulative distribution curves (Fig. 3). The difference becomes apparent at the limit of 55 points: in this case 60 percent of the respondents with income ranging from LTL 2000 or more rated QoL with up to 55 points whereas, such scores were given by even 90 percent of respondents with lower income.

Fig. 3. Distribution of quality of life assessment scores based on income (AF-QoL) (GK balai – QoL score)

The non-parametric Mann-Whitney criterion, frequency tables, and Chi-square criterion were applied for analysis of the QoL areas depending on **marital status** based on AF-QoL questionnaire. Using the statistics of Mann-Whitney criterion and comparison of the mean ranking helped to identify a statistically reliable indicator that married respondents gave higher scores in domains of general QoL assessment (p=0.026) although no statistically significant differences were identified in individual domains (Table 17).

Table 17. Indices of QoL of patients with AF based on marital status (AF-QoL)

Marital status	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
Married	116.98	120.63	101.60	121.54
Single	110.58	102.48	94.80	100.44
p *	0.498	0.055	0.476	**0.026**

Mann – Whitney cr., mean ranks are compared.

Statistically significant differences in all areas except for pain and health change were identified during assessment of the results from SF-36 questionnaire(Table 18). Comparison of the mean ranks showed statistically reliable results that married respondents assessed QoL better.

Table 18. Indices of QoL of patients with AF based on marital status (SF-36)

Marital status	Domains of SF-36										
	FA	RP	P	GHP	VT	SF	RE	ES	HC	PH	MH
Married	123.3	120.6	116.9	121.1	24.0	123.3	121.2	124.4	120.2	122.7	126.0
Single	96.3	102.4	110.7	101.5	94.8	96.4	101.0	91.98	103.2	97.7	90.4
p *	**0.004**	**0.044**	0.513	**0.038**	**0.002**	**0.004**	**0.026**	**0.001**	0.059	**0.008**	**0.000**

Mann-Whitney cr., mean ranks are compared. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general)

To sum up, we may claim that factors having a statistically significant impact on general QoL are as follows: gender, income, marital status, and education. The impact of education on general QoL assessment was verified by means of AF-QoL questionnaire, whereas SF-36 questionnaire served as means for identification of a statistically significant difference only the area of general physical QoL assessment but not in the area of general mental QoL assessment. We can see that in terms of studying patients with AF, assessment of the impact of education on changes in QoL is more accurate when using the disease-specific AF-QoL questionnaire.

Whereas the total amount of points accumulated by half of the patients based on AF-QoL questionnaire is less than 40 (median), we used logistic regression analysis to identify factors prognosticating outcome above 40 points.

Based on the data of logistic regression analysis (Table 19), independent social-demographical factors prognosticating assessment above 40 points are as follows: the male gender (odds ratio: 1.8; 95 percent CI 1-3.4; p=0.048), growing income (odds ratio: 1.6; 95 percent CI 1-2.5; p=0,041), better education (odds ratio: 1.46; 95 percent CI 1.03-2.07, p=0.033). Marital status and age are not classified as independent risk factors.

Table 19. Relation between the quality of life and social-demographical factors (AF-QoL)

Social-demographical factors	Odds ratio	95% confidence intervals	p
Gender (male)	1.8	1-3.4	**0.048**
Growing income	1.6	1-2.5	**0.041**
Marital status (maried)	1.2	(0.8-2)	0.4
Better education	1.46	1.03-2.07	**0.033**
Age	0.9	0.7-1.6	0.6

Assessment of the QoL with of patients with AF based on the clinical characteristics of atrial fibrillation and comorbidities

The Kruskal-Wallis criterion was applied for analysis of health-related QoL indicators depending on **duration of AF** by using AF-QoL questionnaire. The differences between the mean scores of QoL assessment by independent groups of respondents were evaluated by means of applying the ANOVA method. Statistically significant differences in the domains of physical, general QoL, and sexual activity were identified by applying the Kruskal-Wallis criterion (Table 20). Upon comparison of the mean ranks it was determined that the lowest scores in terms of QoL assessment were given by patients whose duration of AF ranged from 5 to 10 years. The best results in the area of physical QoL were identified in cases when the duration of AF was under 0.5 years, whereas in the area of sexual activity it was under 1 year. The highest scores in terms of the general QoL were given in cases when the duration of AF was under 0.5 years.

Table 20. Indices of QoL of patients with AF based on duration of AF(AF-QoL)

Duration of atrial fibrillation (in years)	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
< 0.5	129.08	139.68	116.46	139.05
0.5 - 1	120.91	106.64	120.46	118.18
1 – 5	109.9	109.65	91.50	105.7
5 – 10	102.33	92.07	75.08	94.24
>10	109.68	120.00	100.31	118.26
p *	0.291	**0.007**	**0.004**	**0.009**

Kruskal-Wallis cr., mean ranks are compared.

The Kruskal-Wallis criterion was applied for QoL assessment depending on the duration of AF based on the areas specified in SF-36 questionnaire, the mean ranks were compared (Table 21). The following statistically significant differences were identified: in the area of physical functioning patients with the duration of AF ranging from 0.5 to 1 years and from 5 - 10 years gave the lowest scores in terms QoL assessment; in the areas of pain and energy/ vitality the best results were recorded when the duration of AF was under 0.5; the general health assessment was getting worse along with increasing duration of AF; the area of social functioning suffered the biggest negative impact within the disease duration period ranging from 5 to 10 years; the general index of physical health was the lowest within the disease duration period from 5 to 10 years; the general mental QoL was assessed best when the duration of AF was under 0.5 years and remained similarly worse after this limit was exceeded.

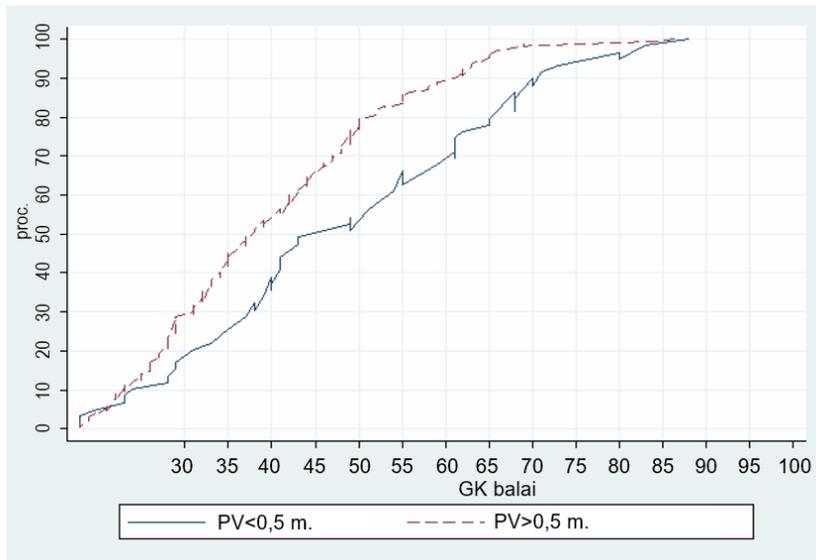**Table 21. Indices of QoL of patients with AF based on duration of AF (SF-36)**

Duration of atrial fibrillation (in years)	Domains of SF-36										
	FA	RP	P	GHP	VT	SF	RE	ES	HC	PH	MH
<0.5	141.9	133.5	134.1	137.7	144.3	137.2	129.1	129.1	117.3	143.8	140.6
0.5 - 1	97.13	112.9	106.5	126.2	106.4	102.3	109.6	109.8	87.70	106.8	106.6
1 – 5	113.8	106.3	114.4	103.6	101.6	111.5	111.7	109.3	120.4	110.0	105.3
5 – 10	86.54	117.1	105.8	102.5	106.1	99.36	110.1	114.5	121.8	92.47	108.0
>10	118.4	92.15	84.50	101.5	112.7	109.8	100.7	95.94	109.0	101.8	102.8
p value*	**0.001**	0.060	**0.041**	**0.014**	**0.002**	**0.034**	0.348	0.290	0.158	**0.002**	**0.015**

Kruskal-Wallis cr., mean ranks are compared. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general)

The best duration of AF in terms of statistical reliability is up to 0.5 years. Later no statistically significant changes were observed.

We have also applied the ANOVA model in order to evaluate the impact of duration of AF on QoL assessment: the results showed that differences of the mean assessments of the quality of life among independent groups of respondents were statistically significant.

Detailed differences of QoL assessment depending on the type of AF determined by means of using AF-QoL questionnaire are specified on the cumulative distribution curves (Figure 4). The difference becomes apparent at the limit of 50 points: 50 percent of the respondents with AF duration under 0.5 years assessed QoL with up to 50 points, whereas in case of a longer AF duration the QoL was ranked with less than 50 points by even 80 percent of the respondents.

Fig. 4. Distribution of QoL assessment scores based on duration of AF (AF-QoL)
(GK-balai – QoL score, m – years)

In case of analysis of the QoL indices depending on the **type** of AF based on AF-QoL questionnaire, application of the Kruskal-Wallis criterion revealed the presence of a statistically significant difference only in the physical domain of QoL assessment as the QoL was rated with the lowest scores by patients having permanent AF (Table 22). Upon comparison of the mean ranks it was found that patients with permanent AF rated QoL with the lowest scores, whereas patients with paroxysmal AF gave higher scores, however, the differences are not statistically significant in the domain of general QoL.

Table 22. Indices of QoL of patients with AF based on the type of AF (AF-QoL)

Type of atrial fibrillation	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
Paroxysmal	115.24	122.3	112.85	120.02
Persistent	117.25	119.05	93.32	117.17
Permanent	107.00	85.3	94.61	96.63
p *	0.723	**0.015**	0.083	0.195

Kruskal-Wallis cr., mean ranks are compared.

Analysis of the QoL depending on the type of AF using SF-36 questionnaire (Table 23) showed statistically reliable differences in the areas of FP, P, GHP, SF and PH. Comparison of the mean ranks in accordance with the Kruskal-Wallis criterion revealed that the QoL was ranked the highest by patients with paroxysmal AF basically in all these areas, whereas the lowest scores were given by patients with permanent AF. Subjects with persistent AF also ranked the QoL with the lowest scores only in the domain of pain.

Analysis based on the ANOVA model confirmed the statistically significant differences depending on the type of AF.

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Table 23. Indices of QoL of patients with AF based on the type of AF (SF-36)

Type of atrial fibrillation	Domains of SF-36										
	FA	**RP**	**P**	**GHP**	**VT**	**SF**	**RE**	**ES**	**HC**	**PH**	**MH**
Paroxysmal	131.4	118.9	113.9	129.4	122.9	124.7	112.6	120.6	122.9	133.7	123.4
Persistent	112.4	114.6	105.8	113.1	113.9	117.7	120.3	111.5	112.1	110.6	113.6
Permanent	86.89	107.4	107.6	88.90	100.9	84.07	102.4	110.6	106.7	87.77	100.5
p *	**0.003**	0.665	**0.019**	**0.010**	0.252	**0.008**	0.316	0.597	0.356	**0.002**	0.225

*Kruskal-Wallis cr., mean ranks are compared. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general)

To sum up, we may claim that duration of AF is related to the QoL assessment: the shorter the duration of AF is, the better QoL assessment there is. Analysis by means of using both questionnaires, i.e. the disease-specific and the general, has shown statistically significant results in areas reflecting general(global) QoL.
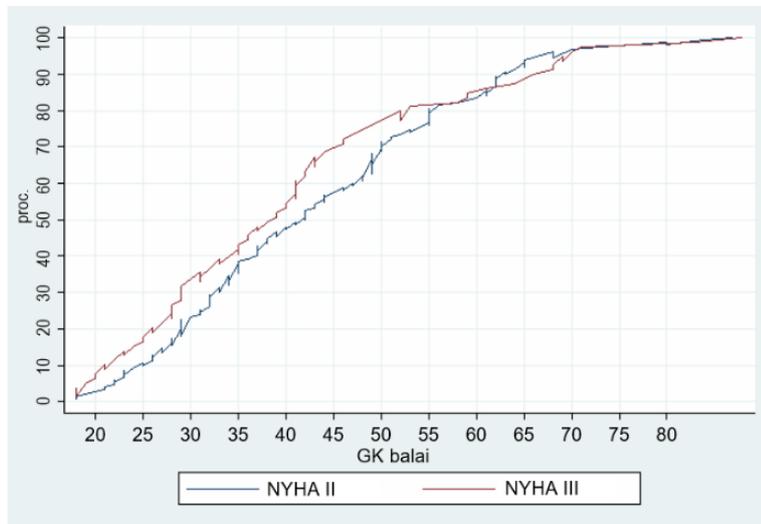
We have assessed the relation between QoL and **heart failure** by using non-parametric Mann-Whitney criterion. Statistically significant differences have been identified in all domains of AF-QoL questionnaire (Table 24). Comparison of the mean ranks has shown that patients, who have been diagnosed with heart failure of functional class III, ranked the QoL with lower scores. In case of application of Student-T criterion, statistically significant differences were identified in the areas of assessment of physical QoL (p=0.006), sexual activity (p=0.045), and general QoL (p=0.008), however, no statistically significant differences were identified in the area of assessment of psychological QoL (p=0.062). No statistically significant differences were identified by means of analysis of the impact of the **EHRA symptom class** of AF on assessment of the QoL (Table 24).

Table 24. Indices of QoL of patients with AF based on clinical features (AF-QoL)

Clinical features	Domains of AF-QoL			
	Psychological	Physical	Sexual activity	Global
NYHA functional class				
II	107.45	108.5	92.46	108.93
III	86.72	83.9	75.2	83.04
p *	**0.022**	**0.007**	**0.04**	**0.004**
EHRA symptom class				
II	109.63	104.3	99.8	108.53
III	106.55	108.93	90.6	107.04
p *	0.736	0.613	0.279	0.871

*Mann-Whitney cr., mean ranks are compared. NYHA– New York Heart Association, EHRA– European Heart Rate Association

Detailed differences between patients with heart failure of NYHA functional class II and III in terms of assessment of the QoL based on AF-QoL questionnaire are specified on the cumulative distribution curves (Fig. 5).

Fig. 5. Distribution of the QoL assessment scores based on NYHA f. class (AF-QoL)
(GK balai – QoL score)

Analysis of the results of assessment of the QoL using SF–36 questionnaire applying the Mann-Whitney criterion and comparing the mean ranks (Table 25) showed statistically significant differences in the domains of PF, RE, RP, GHP, SF, as well as general physical and mental health. Comparison of the mean ranks showed that patients of NYHA functional class III ranked the QoL with lower scores comparing to patients of functional class II. No statistically significant differences were identified in case of assessment of the relation between AF symptom class of EHRA and the health-related QoL.

Therefore, we may claim that a higher functional class of heart failure is related to lower QoL assessment, whereas the impact of EHRA symptom class is not reliable in terms of statistical significance in case of assessment of the QoL.

Table 25. Indices of QoL of patients with AF based on clinical features (SF-36)

Clinical features	Domains of SF-36										
	FA	**RP**	**P**	**GHP**	**VT**	**SF**	**RE**	**ES**	**HC**	**PH**	**MH**
NYHA f.class											
II	112.5	106.4	106.4	110.0	106.4	110.5	107.8	105.7	105.9	112.6	108.2
III	74.0	89.2	89.3	80.3	89.2	79.04	85.71	89.3	90.3	73.89	84.6
p *	**0.000**	**0.047**	0.057	**0.001**	0.057	**0.000**	**0.011**	0.071	0.070	**0.000**	**0.009**
EHRA s.class											
II	108.4	108.0	111.9	117.3	106.2	109.2	104.2	110.1	109.1	112.8	108.4
III	107.0	107.2	105.5	103.0	108.0	106.7	108.9	105.6	106.7	105.1	108.0
p *	0.886	0.930	0.479	0.117	0.848	0.788	0.594	0.619	0.787	0.401	0.881

Whereas almost half of the respondents were diagnosed with angina pectoris (49.8 percent), we assessed, if it was related to the QoL assessment. The non-parametric Mann-Whitney criterion was applied. Statistically significant differences were identified in the areas of general QoL assessment by means of analysing the results of Questionnaire AF-QoL on assessment of the quality of life (Table 26).

Table 26. Indices of QoL of patients with AF according with angina pectoris (AF-QoL)

Angina pectoris	Domains of AF-QoL			
	Psychological	**Physical**	**Sexual activity**	**Global**
Stabile				
Yes	90.69	100.64	95.06	98.5
No	119.39	117.59	100.98	117.97
p *	**0.018**	0.163	0.587	0.11
Unstabile				
Yes	114.75	110.52	89.35	107.9
No	115.13	117.36	104.93	118.7
p *	0.966	0.457	0.074	0.242

Mann-Whitney cr., mean ranks are compared.

Analysis of the results of SF–36 questionnaire in respect of the relation between assessment of the Qol and angina pectoris (Table 27) showed a statistically significant change only in the area of physical functioning in the group of stable angina pectoris, however, in this case no such change was identified in the areas of general physical and mental QoL. In case of the group of patients with unstable angina pectoris, statistically significant differences were identified in the domains of PF, P and general physical health. Comparison of the mean ranks showed that patients with angina pectoris ranked the QoL with lower scores.

Table 27. Indices of QoL depending on angina pectoris (using Questionnaire SF-36).

Angina pectoris	Domains of SF-36										
	FA	**RP**	**P**	**GHP**	**VT**	**SF**	**RE**	**ES**	**HC**	**PH**	**MH**
Stable											
Yes	106.5	129.4	115.4	108.3	106.3	112.0	112.9	116.8	114.8	111.1	111.9
No	116.5	112.3	114.9	116.2	116.5	115.5	115.3	114.0	115.0	115.6	115.5
p *	**0.049**	0.143	0.963	0.515	0.398	0.772	0.832	0.819	0.987	0.709	0.767
Unstable											
Yes	100.6	14.97	99.43	110.8	108.9	105.8	104.9	106.4	106.4	101.3	106.2
No	122.5	120.2	123.2	117.1	118.9	119.8	120.2	118.7	119.5	122.1	119.6
p *	**0.017**	0.082	**0.009**	0.489	0.310	0.124	0.084	0.178	0.133	**0.024**	0.145

Kruskal-Wallis cr., mean ranks are compared. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general).

To sum up, we may claim that heart failure has an impact on general QoL assessment. In case of patients with AF and heart failure, lower QoL was reported in the areas of general QoL assessment based on both questionnaires (p<0.005). In case of patients with angina pectoris, no statistically significant differences were identified in the domains of general QoL assessment both in groups of patients with stable and unstable angina pectoris in terms of QoL assessment based on AF-QoL questionnaire. A statistically significant difference was identified only in the area of assessment of the general physical health in SF-36.

Based on the research data of binary logistic regression analysis, only the duration of AF less than 0.5 is an independent factor determining a better QoL above 40 points (median) in case of assessment based on AF-QoL questionnaire. However, the best QoL, when the total sum of points exceeds > Q3=52 (the third quartile, the sum of points of i.e. 75% of the respondents < 52), is determined by independent factors: duration of AF is less than 0.5 years (odds ratio: 2.9; 95 percent CI 2.4-5.9; p=0.004) and NYHA functional class not exceeding classes I-II (odds ratio: 2.1; 95 percent CI 1.03-5.2; p=0.043). Form, type of AF, EHRA symptom class, incidence of angina pectoris or myocardial infarction were not independent risk factors (Table 28).

Table 28. Relation between assessment of the QoL and characteristics of AF and comorbidities (AF-QoL)

Characteristics of atrial fibrillation and concomitant diseases	Odds ratio	95% confidence intervals	p
Duration of atrial fibrillation < 0,5 years	2.9	2.4-5.9	0.004
Form of atrial fibrillation	1.2	0.5-2.5	0.5
Type of atrial fibrillation	0.9	(0.4-2)	0.8
NYHA I or II	2.1	1.03-5.2	0.043
EHRA I or II	1.1	0.8-2	0.7
Stable angina pectoris	1.2	0.7-3	0.5
Unstable angina pectoris	1.1	0.5-2.1	0.9
Myocardial infarction	2	0.7-5	0.2

NYHA – New York Heart Association, EHRA – European Heart Rhythm Association

General assessment of the sense of coherence in patients with atrial fibrillation

The level of the general sense of coherence consists of such components as comprehensibility, meaningfulness and manageability. These components are assessed individually on the scale of SOC and a general assessment of SOC is provided. We assessed the general SOC and its components of patients with AF according to social-demographical factors, the impact of AF and comorbidities.

It was found that the general level of SOC of AF patients was 46.34 points (SD: 6.581) (Table 29). A low level of SOC was determined in case of 5 patients (2.2 percent), the average level was determined in case of 130 patients (56.8 percent), and a high level was determined in case of 94 patients (41 percent). 1 patient got a minimum number of points (25 points) and 2 patients got a maximum number of points (60 - 65 points). 197 respondents got more than 40 points.

Table 29. The mean assessment of SOC of patients with AF in a general group of respondents

Domains of SOC-13	Number	Min points	Max points	Average	Standard deviation
Comprehensibility	229	7	25	**17.45**	3.015
Manageability	229	7	20	**14.23**	2.301
Meaningfulness	229	5	20	**14.66**	2.541
Global score of sense of coherence	229	25	65	**46.34**	6.581

Comparison of the mean scores of assessment of the SOC showed that males had higher score in all domains of SOC-13 questionnaire (Table 30).

Table 30. The mean assessment of SOC of patients with AF comparing male and female respondents

Domains of SOC-13	Number	Average	Females	Males
Comprehensibility	229	17.45	**16.79**	**17.95**
Manageability	229	14.23	**13.90**	**14.48**
Meaningfulness	229	14.66	**14.29**	**14.93**
Global score of sense of coherence	229	46.34	**44.98**	**47.37**

Sense of coherence of patients with atrial fibrillation according to sociodemographical factors

We applied the non-parametric Mann-Whitney criterion in order to analyse the impact of **gender** on SOC: statistically significant differences were identified in all domains of SOC-13 questionnaire (Table 31). Comparison of the mean ranks showed that the general SOC of men was higher comparing to women (p=0.013), males were characteristic of a higher level of comprehensibility (p=0.012) and meaningfulness (p=0.049), they were more capable of perceiving the environment as manageable and controllable (p=0.049) (Table 31). In case of applying the Student-T criterion for assessment of the impact of gender on the level SOC, statistically significant differences were identified only in the domains of comprehensibility (p=0.04) and global score of SOC (p=0.006).

Table 31. Indices of the sense of inner coherence based on gender

Gender	Domains of SOC-13			
	Comprehensibility	Manageability	Meaningfulness	Global score of sense of coherence
Females	102.42	105.14	105.22	102.52
Males	124.58	122.511	122.45	124.51
p*	**0.012**	**0.047**	**0.049**	**0.013**

Mann-Whitney cr., mean ranks are compared.

The Kruskal-Wallis criterion was applied for analysis of the impact of **age** on SOC (Table 32). Upon comparison of the mean ranks, a statistically significant difference was identified in the area of meaningfulness (p=0.035), in this case the group of the age of 61- 65 stand out with lower scores. We may claim that age does not have a statistically significant impact on the level of inner coherence in the group of patients with AF.

Table 32. Indices of the sense coherence depending on age

Age (years)	Domains of SOC-13			
	Comprehensibility	Manageability	Meaningfulness	Global score of sense of coherence
50 – 55	111.09	112.74	135.17	117.81
56 – 60	124.69	116.06	122.17	122.64
61 – 65	107.14	109.22	96.43	103.43
66 – 70	116.54	118.53	112.28	116.3
p*	0.612	0.869	**0.035**	0.537

Kruskal-Wallis cr., mean ranks are compared.

No statistically significant differences were identified during analysis of the impact of education on the level of SOC (Table 33), although comparison of the mean ranks in the area of comprehensibility, manageability and global score of SOC showed lower scores in the group of respondents with elementary-secondary education.

Table 33. Indices of the sense of coherence depending on education

Education	Domains of SOC-13			
	Comprehensibility	Manageability	Meaningfulness	Global score of sense of coherence
Elementary, incomplete secondary, secondary	105.44	106.56	121.77	109.29
Vocational	118.97	128.04	109.27	118.81
Higher/ incomplete higher education	120.31	114.58	112.80	117.40
p *	0.292	0.185	0.515	0.644

Kruskal-Wallis cr., mean ranks are compared.

The Kruskal-Wallis criterion was applied for assessment of the impact of the mean monthly **income** on the level of SOC (Table 34). Statistically significant differences were identified in the areas of comprehensibility, meaningfulness, and global score of SOC. Comparison of the mean ranks showed a reduced level of SOC in cases when the mean family income was under 580 eur per month, whereas respondents with monthly family income above 580 eur were characteristic of a higher level of SOC in all domains.

Table 34. Indices of the sense of coherence based on the mean family income

Income	Domains of SOC-13			
	Comprehensibility	Manageability	Meaningfulness	Global score of sense of coherence
145 – 290 eur (500-1000 Lt)	99.63	99.55	94.51	94.23
290 – 435 eur (1000-1500 Lt)	124.85	125.18	101.81	119.39
435 – 580 eur (1500-2000 Lt)	102.87	110.19	111.68	105.43
> 580 eur (> 2000 Lt)	134.30	127.83	143.67	139.93
p*	**0.007**	0.061	**0.000**	**0.001**

Kruskal-Wallis cr., mean ranks are compared.

The non-parametric Mann-Whitney criterion was applied for assessment of the impact of the **marital status** on SOC (Table 35): a statistically significant difference was

identified in the areas of meaningfulness and global score of SOC, i.e. single patients had a lower level of SOCand perceived the environment as less meaningful.

Table 35. Indices of the sense of coherence based on marital status

Marital status	Domains of SOC-13			
	Comprehensibility	Manageability	Meaningfulness	Global score of sense of coherence
Married	119.54	120.35	121.89	122.24
Single	104.89	103.08	99.68	98.89
p*	0.119	0.065	**0.018**	**0.014**

*Mann-Whitney cr., mean ranks are compared.

To sum up, we may claim that social-demographical factors affecting the general level of SOC of patients with AF are as follows: gender, income, and marital status. Women, single patients and people with low income are characteristic of lower SOC. The age of patients with AF is only associated with reduction of SOC only in the domain of meaningfulness in the group of 61-65-year-old respondents. The results obtained by us did not reveal any statistically significant differences in terms of assessment of SOC depending on education.

Assessment of the sense of coherence of patients with atrial fibrillation based on clinical features of atrial fibrillation and comorbidities

The Kuskal-Wallis criterion was applied for analysis of the impact of the duration and type of AF on the SOC score: no statistically significant differences were identified in any domain of the SOC-13 scale (Table 36).

Table 36. Indices of the sense of coherence based on duration and type of AF

Duration of atrial fibrillation	Domains of SOC-13			
	Comprehensibility	Manageability	Meaningfulness	Global score of sense of coherence
< 0.5	121.72	119.14	123.57	124.67
0.5 - 1	127.29	119.88	134.80	129.11
1 – 5	103.54	107.99	110.16	104.56
5 – 10	127.71	126.66	99.86	119.99
>10	100.62	101.74	110.47	99.32
p *	0.169	0.513	0.190	0.209
Type of atrial fibrillation				
Paroxysmal	113.98	115.40	110.90	112.13
Persistent	112.47	113.67	118.72	115.48
Permanent	125.66	118.50	111.83	119.81
p*	0.575	0.928	0.685	0.844

*Kruskal-Wallis cr., mean ranks are compared.

The non-parametric Mann-Whitney criterion was applied for assessment of the impact of the NYHA functional classes of heart failure and EHRA symptom classes of AF on the SOC score (Table 37). NYHA functional class did not affect the SOC, no statistically significant differences were identified. In case of assessment of the impact of EHRA symptom class of AF on the level of SOC, statistically significant differences were identified in the domains of comprehensibility, meaningfulness, and the global score of SOC. Comparison of the mean ranks showed that patients assigned to EHRA symptom class III were characteristic of a lower comprehensibility, meaningfulness, and the global score of SOC. Angina pectoris did not affect the level of SOC of respondents, no statistically significant differences were identified in the groups of patients with stable and unstable AP. Analogous data was obtained by applying the Student-T criterion.

Table 37. Indices of the sense of coherence based on comorbidities

Concomitant diseases	Domains of SOC-13			
	Comprehensibility	Manageability	Meaningfulness	Global score of sense of coherence
Heart failure, NYHA				
II	104.61	105.91	103.10	105.50
III	93.78	90.54	97.53	91.56
p *	0.230	0.088	0.536	0.125
EHRA symptom class of atrial fibrillation				
II	120.8	123.77	112.46	120.63
III	101.67	100.25	105.29	101.65
p*	**0.038**	**0.010**	0.430	**0.038**
Stable angina pectoris				
Yes	104.50	108.36	108.50	104.99
No	116.89	116.20	116.17	116.81
p *	0.305	0.515	0.525	0.331
Unstable angina pectoris				
Yes	106.56	107.05	111.25	107.31
No	119.44	119.19	116.97	119.05
p*	0.159	0.183	0.531	0.202

Mann-Whitney cr., mean ranks are compared. NYHA – New York Heart Association, EHRA – European Heart Rhythm Association

To sum up, we may draw a conclusion that a higher EHRA symptom class (III) of AF was significant to changes in SOC. The general level of SOC was not statistically dependant on the type and duration of AF, functional class of heart failure, and AP.

Analysis of the relation between QoL and sociodemographical factors has shown that the male gender, higher level of education, higher income, and the marital status (living with the spouse) were related to better QoL assessment in general. Analysis of the correlation between assessment of SOC and sociodemographical factors showed that the

male gender, higher income, and the marital status (living with the spouse) were related to a higher level of the SOC.

Analysis of correlation between the quality of life and sense of coherence in patients with atrial fibrillation

An analysis of mutual correlation of the derivative indicators identified by means of all questionnaires was made in order to assess the correlations between the QoL and AF (Table 38). It was found that there was a statistically significant relation among all areas of the questionnaires ($p < 0.005$, in many cases: $p < 0.001$) and a positive correlation. In case of assessment of intensity of the correlation based on the value scale of the correlation coefficient (cc), when 0 means no relation, 0-0.2 means very weak correlation, 0.2-0.5 means weak correlation, 0.5-0.7 means average correlation, and 0.7-1 means strong correlation. An average correlation between general QoL based on AF-QoL questionnaire and the global score of SOC (cc - 0.52); areas of SF-36 questionnaire, i.e. comprehensibility and emotional state (cc - 0.501), as well as between the global score of SOC and emotional state (cc - 0.595) and the general mental health (cc – 0.55) were identified.

Table 38. Correlation of the derivative indicators of the QoL and SOC based on questionnaires AF-QoL, SF-36 and SOC-13

Spearman's correlation			AF-QoL				SF-36										
			PD	FD	SA	G	FA	RP	P	GHP	VT	SF	RE	ES	HC	PH	MH
SOC-13	Comprehensibility	cc	.455	.296	.369	.444	.181**	.214**	.292**	.401**	.312**	.319*	.283**	**.501***	.173**	.331*	.447**
		p	.000	.000	.000	.000	.006	.001	.000	.000	.000	.000	.000	.000	.009	.000	.000
	Manageability	cc	.422	.330	.337	.442	.220**	.214*	.224**	.346**	.324**	.330*	.227*	.485*	.228**	.322*	.438**
		p	.000	.000	.000	.000	.001	.001	.001	.000	.000	.000	.001	.000	.000	.000	.000
	Meaningfulness	cc	.289	.343	.340	.378	.279**	.235*	.278**	.442**	.398**	.404*	.230*	.489*	.198*	.419*	.483**
		P	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.000	.000
	Global score of the sense of coherence	cc	.479	.395	.442	**.520**	.279**	.286**	.332**	.478**	.419*	.409*	.321*	**.595***	.229**	.440*	**.550****
		P	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

PD – psychological domain; FD – physical domain; SA – sexual activity domain; G – global quality of life. **FA -** Physical functioning, RP - Role limitations due to physical health problems, P – pain, GHP – general health perception, VT – Vitality, SF - Social functioning, RE - Role limitations due to emotional health problems, ES - Emotional state, HC - Health change, PH - Physical health (general), MH - Mental health (general). cc- correlation coefficient.

CONCLUSIONS

1. Cultural – linguistic validation of disease specific health-related quality of life questionnaire AF-QoL was accomplished in Lithuania. It was as well determined that Lithuanian version has a good validity - Cronbach's alfa of Lithuanian AF-QoL questionnaire version is 0,913.

2. AF patients are characterized assessing their quality of life satisfactory. Average score of health-related quality of life in patient with atrial fibrillation on SF-36 questionnaire is 44,15, the best result was determined in social and physical functioning, vitality and emotional state domains. Average score of quality of life in AF-QoL questionnaire is 32,2. The psychological domain was rated as the lowest.

3. The better assessment of health-related quality of life of patients with AF was affected by sociodemographic factors: male gender, higher education, higher income rates, marital status (married) as well as medical factors: shorter duration of AF, lower NYHA functional class of heart failure.

4. Average level of sense of coherence (46,3 points) was established for patients with AF. In additions, situations of management and control and meaningfulness of sense of coherence were evaluated as the worst.

5. The following sociodemographic factors have a positive impact on a general sense of coherence of patients with AF: male gender, higher income rates, marital status (married) as well as medical factors such as higher EHRA symptom class.

6. A statistically significant and positive correlation was defined between health-related quality of life questionnaires SF-36 and AF-QoL domains and sense of coherence questionnaire SOC-13 domains.

PRACTICAL RECOMMENTATIONS

Generic QoL questionnaire SF-36 can be used for assessment of quality of life of patients with AF, however, in clinical practice it is recommended to use disease-specific QoL questionnaire AF-QoL in order to properly choose optimal treatment strategy, evaluate AF treatment effectiveness correctly. In addition, questionnaire AF-QoL is filled in easier and reflects changes of quality of life related to AF more sensitive. A permission of questionnaire AF-QoL authors to use it in Lithuania for academic and practical purposes is received. In scientific researches it is highly recommended to use both questionnaires as the results of generic questionnaire SF-36 obtained from patients with AF may be compared between each other at presence of other diseases, other research circumstances or analyzing different populations.

In order to improve quality of life of patients suffering from AF it is purposeful to manage a close relationship between doctor and patient while arranging treatment plan taking into account economic issues as lower family income rates influence assessment of QoL negatively. It is very important in case of repeated hospitalizations, blood tests as these situations are closely related to temporary or long-term disability due to frequent hospitalizations for reason to recover sinus rhythm or repeat blood tests to evaluate INR using Warfarin. It is recommended to extend the reimbursement of medicines related to AF and to include novel oral anticoagulants.

In clinical practice it is as well recommended to pay attention to a better control of heart failure symptoms as when they are strongly expressed they become associated with worse assessment of QoL correspondingly.

While planning and arranging programs for long-term monitoring and health maintenance and improvement for patients suffering from heart failure it is recommended to take into account sociodemographic factors such as education, income rate as well as value of family in human life.

Moreover, while providing health care services for patients with AF and evaluating their quality it is appropriate to note that not only medical and sociodemographic factors do affect QoL of patients but internal psychological health resources as well among which the most important is the level of sense of coherence of patient. The level of sense of coherence can be enhanced at any age of a human being.

PUBLICATION AND PRESENTATIONS

1. Karpavičienė V, Kalibatienė D. Gyvenimo kokybės tyrimas sergant prieširdžių virpėjimu (Literatūros apžvalga) (Quality of life in patients with Atrial fibrillation (Literature review)). Medicinos Teorija ir praktika 2010; 16(4):478-483.
2. Karpavičienė V, Kalibatienė D. AF-QoL klausimyno validavimo Lietuvoje procedūra. (Validisation of AF-QoL questionnaire in Lithuania). Medicinos teorija ir praktika 2014; 20(4):319-323.
3. Karpavičienė V, Kalibatienė D. Prieširdžių virpėjimu sergančių pacientų su sveikata susijusi gyvenimo kokybė tiriant ligai specifiniu AF-QoL klausimynu (Qualty of Life in patients with Atrial Fibrillation, detected using diesease-spesific questionnaire AF-QoL). Medicinos teorija ir praktika 2015;21(4.3):778-785.
4. Karpavičienė V, Kalibatienė D., Gaigalaitė V. Prieširdžių virpėjimu sergančių pacientų vidinė darna (Sence of coherence in patients with atrial Fibrillation). Medicinos teorija ir praktika 2015;21(4.3):841-847.
5. Poster Presentation: Karpavičienė V., Kalibatienė D. Health-related Quality of Life of Patients with AtrialFibrillation Aged 50 to 70 Years: Research in Vilnius City Clinical Hospital (Lithuania). The 8th Baltic Morphology Scientific Conference 2015", 2015, 12-14. November, Vilnius.

6. Poster Presentation: Karpavičienė V., Kalibatienė D. Sence of Coherence in patients with atrial fibrillation. International conference „Evolutionary medicine: pre-existing mechanisms and patterns of current health issues". 14-16 June 2016, Vilnius, Lithuania. Poster presentation is accepted.

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SANTRAUKA

Darbo aktualumas

Širdies ir kraujagyslių sistemos ligos paskutinį dešimtmetį tapo svarbiausia mirties priežastimi visame pasaulyje. Šios sistemos ligos yra pagrindinė mirties priežastis Lietuvoje ir Europoje. Lietuvos higienos instituto duomenimis 2014 m. mirtys dėl kraujo apytakos ligų sudarė 64,9 proc. tarp moterų ir 47,0 proc. tarp vyrų.

Nežiūrint moderniausių diagnostikos ir gydymo priemonių, sergamumas kardiovaskulinės sistemos ligomis Lietuvoje sparčiai didėja. Šalies gyventojų mirtingumas dėl koronarinės širdies ligos, insulto – vienas didžiausių Europoje, kardiovaskulinio sergamumo ir mirtingumo rodikliai beveik 2–3 kartus blogesni už Europos Sąjungos vidurkius. Dažnai miršta darbingo amžiaus, energingi žmonės, daugelis susirgusiųjų lieka neįgaliais.

Prieširdžių virpėjimas (PV) – dažniausia ilgalaikė aritmija, kurios metu mirštamumo dažnis padidėja du kartus, didėja insulto rizika, nukenčia gyvenimo kokybė (GK) bei fizinis pajėgumas, pacientai dažniau hospitalizuojami. Neatsiejamos PV gydymo pasekmės – šalutinis vaistų poveikis, medicininės intervencijos, dažnos hospitalizacijos. Visa tai turi didelės įtakos gyvenimo kokybei. Pastarąjį dešimtmetį atliktos studijos nurodo, kad grąžinus sinusinį ritmą ar pasiekus normosistoliją, GK, deja, ne visada pagerėja. Pagal PV gydymo rekomendacijas, pagrindiniai objektyvūs gydymo efektyvumo rodikliai ne tik klinikinių simptomų sumažinimas, bet ir GK pagerinimas. Mokslininkai rekomenduoja atlikti kuo daugiau tyrimų, siekiant identifikuoti veiksnius, turinčius įtakos su sveikata susijusios GK vertinimui sergant PV.

GK vertinimas kardiologijoje tampa vis aktualesnis ir kitais aspektais. Pirma - klinikinėje praktikoje tampa svarbi ne tik gydytojo, bet ir paciento nuomonė pasirenkant gydymo taktiką. Pagal 2014 m. Amerikos kardiologų draugijos rekomendacijas permanentinio prieširdžių virpėjimo gydymo taktikos parinkimui (ritmo ar dažnio kontrolei, antikoaguliaciniam gydymui) turi įtakos paciento pasirinkimas, priklausomai nuo jo GK vertinimo. Antra - atliekant klinikinius tyrimus, mokslininkai bei farmacinės kompanijos, GK vertinimą įtraukia kaip atskirą gydymo rezultatų vertinimo kriterijų. Trečia, GK tyrimas svarbus ligos rizikos prognozavimui ir valdymui. Analizuojant pacientų pildomus klausimynus apie GK, galima geriau įvertinti ligos riziką, gydymo rezultatus ir paciento lūkesčius, sudaryti optimalų sveikatos paslaugų teikimo planą.

Svarbia tyrimo sritimi tampa tarpkultūrinis GK palyginimas. Dauguma gyvenimo kokybės klausimynų yra anglų kalba, todėl svarbią reikšmę įgija kultūrinis – kalbinis klausimynų adaptavimas skirtingose šalyse ir kultūrose, išlaikant klausimyno turinio, koncepto ir loginės stuktūros (konstrukto) tinkamumą ir patikimumą atskiroje populiacijoje.

Bendra GK yra plati sąvoka, apimanti visas individo gyvenimo sritis ir apibūdinanti jo funkcinę būklę. Ji yra susijusi su individo tikslais, lūkesčiais, gyvenimo standartais bei interesais. Su sveikata susijusi GK – tai bendros gyvenimo kokybės dalis,

kuriai didelės įtakos turi asmens sveikata ir sveikatos priežiūra. Su sveikata susijusi GK atspindi paciento subjektyvaus savo sveikatos vertinimo aspektą, kaip esminį sveikatos priežiūros santykių komponentą. Atskleidžia, kaip individas suvokia ir reaguoja į savo sveikatos būklę ir su sveikata susijusius pojūčius, tokius kaip fizinė, funkcinė, emocinė ir psichinė gerovė.

Su sveikata susijusios GK tyrimai turi didelę svarbą, nes padeda įvertinti gydymo ir kitų sveikatos priežiūros priemonių efektyvumą, sveikatos gerinimo ir ligų profilaktikos programas; naudingi vertinant visuomenės sveikatos būklę ir stebint jos dinamiką, plėtojant valstybės sveikatos politiką.

Siekiant pagerinti sveikatos priežiūros rezultatus, svarbu įvertinti sociodemografinius, medicininius bei individualius paciento veiksnius, galinčius turėti įtakos geresnei gyvenimo kokybei. Individualūs veiksniai – tai bendrieji sveikatos (atsparumo) ištekliai, kurie pagal salutogenezės teoriją palengvina įveikti gyvenimo sunkumus ir ligas. Galimybė panaudoti šiuos išteklius priklauso nuo vidinės darnos, tai yra gebėjimo matyti pasaulį valdomą, suvokiamą ir prasmingą.

Darbo tikslas ir uždaviniai

Darbo tikslas – ištirti PV sergančių pacientų su sveikata susijusią gyvenimo kokybę ir jos sąsajas su sociodemografiniais ir medicininiais veiksniais bei individualiais sveikatos ištekliais (vidine darna).

Darbo uždaviniai:
1. Atlikti ligai specifinio gyvenimo kokybės AF-QoL klausimyno kultūrinio/kalbinio adaptavimo procedūrą Lietuvoje.
2. Įvertinti prieširdžių virpėjimu sergančių pacientų su sveikata susijusią gyvenimo kokybę panaudojant bendrinį SF-36 ir ligai specifinį AF-QoL gyvenimo kokybės klausimynus.
3. Išnagrinėti prieširdžių virpėjimu sergančių pacientų su sveikata susijusią gyvenimo kokybę priklausomai nuo sociodemografinių (lyties, amžiaus, išsilavinimo, pajamų, šeiminės padėties) ir medicininių (prieširdžių virpėjimo trukmės, tipo, simptomų klasės, gretutinių ligų) veiksnių.
4. Įvertinti prieširdžių virpėjimu sergančių pacientų vidinę darną panaudojant SOC-13 vidinės darnos skalę.
5. Išnagrinėti prieširdžių virpėjimu sergančių pacientų vidinę darną priklausomai nuo sociodemografinių (lyties, amžiaus, išsilavinimo, pajamų, šeiminės padėties) ir medicininių (prieširdžių virpėjimo trukmės, tipo, simptomų klasės, gretutinių ligų) veiksnių.
6. Įvertinti prieširdžių virpėjimu sergančių pacientų su sveikata susijusios gyvenimo kokybės ir vidinės darnos sąsajas.

Darbo mokslinis naujumas

Mokslinis darbas, nagrinėjantis PV sergančių pacientų su sveikata susijusią GK naudojant bendrinį SF-36 gyvenimo kokybės klausimyną ir ligai specifinį AF-QoL klausimyną atliktas pirmą kartą Lietuvoje. Tai šalyje pirmas tyrimas, nagrinėjęs sociodemografinių ir medicininių veiksnių įtaką PV sergančių pacientų gyvenimo kokybei. Pirmą kartą analizuota PV pacientų vidinė darna bei jos sąsajos su sociodemografiniais ir medicininiais veiksniais.

Pasirinkta tiriamųjų amžiaus grupė – 50 -70 metų Pažymėtina, kad daugelis darbų, vertinančių kardiovaskulinės patologijos įtaką GK, atliekama vyresnio amžiaus pacientams, neskirstant juos į smulkesnes amžiaus grupes. Senstant dažnėja poliorganinė patologija, atsiranda sveikatos problemos, susijusios su senėjimo fiziologija, todėl ir gyvenimo kokybės vertinimas dažniausiai blogėja.

Bendradarbiaujant su klausimyno autoriais, atlikta ligai specifinio AF-QoL klausimyno daugiapakopio kalbinio ir tarpkultūrinio adaptavimo procedūra Lietuvoje. Patvirtintas jo tinkamumas Lietuvos gyventojų, sergančių PV, su sveikata susijusios GK vertinimui. Gautas autorių sutikimas nemokamai naudoti klausimyną akademiniams ir praktiniams tikslams. Išsamiai aprašyta kalbinio/tarpkultūrinio validavimo procedūra. Iki šiol nėra vieno konkretaus protokolo šiam darbui atlikti, todėl mokslinėje literatūroje rekomenduojama išsamiai aprašyti kiekvieną atliktą klausimyno validavimo procedūrą tam, kad kiti tyrėjai galėtų naudotis šia patirtimi.

Tyrime panaudotas taip pat ir bendrinis SF-36 gyvenimo kokybės vertinimo klausimynas. Tai leidžia PV sergančių pacientų gyvenimo kokybės duomenis lyginti su kitų autorių tyrimų skirtingose populiacijose rezultatais.

Atliktas tyrimas leidžia plačiau pažvelgti į ligos bei sociodemografinius veiksnius, turinčius įtakos GK. Darbo rezultatai gali būti panaudojami kasdieninėje klinikinėje praktikoje pasirenkant gydymo taktiką, skiriant antikoaguliacinį gydymą (senuosius ar naujuosius oralinius antikoaguliantus), kontroliuojant kraujo krešumo rodiklius, širdies ritmą ir dažnį, šalutinį vaistų poveikį bei su šiais veiksniais susijusį hospitalizacijų dažnį.

Darbo rezultatai gali būti naudojami Lietuvos ir Europos sąjungos sveikatos politikoje kuriant sveikatos priežiūros gerinimo strategijas, sudarant ilgalaikes PV sergančių pacientų stebėsenos programas, ligų profilaktikos programas, ypač atkreipiant dėmesį į ekonominės padėties, išsilavinimo įtaką sveikatai; sprendžiant vaistų prieinamumo ir kompensavimo klausimus; skatinant mokslinius tyrimus ir jų finansavimą; įdiegiant GK tyrimo instrumentus skirtingose lingvistiniu ir kultūriniu požiūriu šalyse.

Tyrimo metu po mokslinių straipsnių publikacijų žurnale „Medicinos teorija ir praktika", susidomėjimą galimybe naudotis ligai specifiniu AF-QoL gyvenimo kokybės klausimynu išreiškė Vilniaus universiteto ir Lietuvos sveikatos mokslų universiteto kardiologijos klinikų mokslininkai.

Disertacijos struktūra ir apimtys

Darbą sudaro pagrindiniai skyriai: įvadas, literatūros apžvalga, tyrimo medžiaga ir metodai, rezultatai, rezultatų aptarimas, išvados ir praktinės rekomendacijos; 44 lentelės ir 15 paveikslų. Įvade aprašomas temos aktualumas, tyrimo tikslas, įvardijami iškelti uždaviniai, darbo mokslinis naujumas. Literatūros apžvalgoje aprašomas prieširdžių virpėjimas, apžvelgiami tyrimų rezultatai apie GK sergant PV, aprašoma gyvenimo kokybė, jos vertinimo bendriniai ir ligai specifiniai klausimynai, reikalavimai tarpkultūriniam klausimynų perkėlimui bei vidinė darna, jos vertinimo instrumentai ir ryšys su GK. Skyriuje „Tyrimo medžiaga ir metodai" aprašoma tiriamoji populiacija, tyrimo metodai, eiga, statistinė duomenų analizė. Rezultatų skyriuje pateikiami gauti rezultatai, nurodomas jų statistinis patikimumas. Rezultatų aptarimo skyriuje, rezultatai įvertinami, aptariami, lyginami su kitų tyrėjų duomenimis. Darbo pabaigoje apibendrinami tyrimo rezultatai – pateikiamos išvados ir praktinės rekomendacijos. Pateikiamas literatūros sąrašas, kuriame yra 182 bibliografiniai šaltiniai. Pateikiami 9 priedai.

Išvados

1. Atlikta ligai specifinio su sveikata susijusios gyvenimo kokybės AF-QoL klausimyno kalbinio/kultūrinio adaptavimo procedūra Lietuvoje. Nustatytas geras lietuviškos klausimyno versijos patikimumas (*Cronbach'o alfa* koeficientas - 0,913).

2. Prieširdžių virpėjimu sergantys pacientai gyvenimo kokybę vertino vidutiniškai. Tiriant bendriniu gyvenimo kokybės SF-36 klausimynu, bendras balas siekė 44,15, geriausiai įvertintos socialinė, fizinio aktyvumo, energingumo bei emocinė sritys. Tiriant ligai specifiniu AF-QoL klausimynu, bendras balas siekė 32,2, prasčiausiai vertinta psichologinė sritis.

3. Geresniam bendram su sveikata susijusios gyvenimo kokybės vertinimui sergant prieširdžių virpėjimu turėjo įtakos sociodemografiniai veiksniai: vyriška lytis, aukštasis išsilavinimas, didesnės pajamos, šeiminė padėtis (nevieniši respondentai) ir medicininiai veiksniai: trumpesnė prieširdžių virpėjimo trukmė ir mažesnė širdies nepakankamumo NYHA funkcinė klasė.

4. Prieširdžių virpėjimu sergantiems pacientams nustatyta vidutinio lygio bendra vidinė darna (46,3 balai). Blogiausiai vertintos situacijos valdymo ir kontrolės bei prasmingumo vidinės darnos sritys.

5. Teigiamą įtaką prieširdžių virpėjimu sergančių pacientų bendrai vidinei darnai turėjo sociodemografiniai veiksniai: vyriška lytis, didesnės pajamos, šeiminė padėtis (nevieniši respondentai) ir medicininiai veiksniai: didesnė prieširdžių virpėjimo simptomų klasė (EHRA).

6. Nustatytas statistiškai reikšmingas ryšys ir teigiama koreliacija tarp bendrinio ir su sveikata susijusios gyvenimo kokybės klausimynų ir vidinės darnos klausimyno vertinimo sričių.

Praktinės rekomendacijos

Bendrinis SF-36 gyvenimo kokybės klausimynas gali būti naudojamas vertinant PV sergančių pacientų GK, tačiau klinikiniame darbe, siekiant parinkti optimalią gydymo schemą ir įvertinti PV gydymo efektyvumą, rekomenduojama naudoti ligai specifinį AF-QoL klausimyną, kuris yra lengviau pildomas bei jautriau atspindi GK pokyčius, susijusius su PV. Yra gautas klausimyno AF-QoL autorių leidimas nemokamai naudotis klausimynu Lietuvoje akademiniais ir praktiniais tikslais. Bendrinio SF-36 klausimyno rezultatus, gautus tiriant PV sergančius pacientus, galima lyginti tarpusavyje sergant kitomis ligomis, esant kitoms tyrimo aplinkybėms, tiriant skirtingas populiacijas. Tai reikšminga atliekant mokslinius tyrimus.

Siekiant pagerinti PV sergančiųjų GK, tikslingas glaudus gydytojo ir paciento bendradarbiavimas planuojant gydymo taktiką, atsižvelgiant į ekonominius veiksnius, kadangi mažesnės šeimos pajamos turi neigiamą įtaką GK vertinimui. Tai svarbu pakartotinių hospitalizacijų, bei krešėjimą veikiančių vaistų paskyrimo aspektais, nes yra susiję su laikinu ar ilgalaikiu nedarbingumu dėl dažnų hospitalizacijų bandant atkurti sinusinį ritmą ar kartojant krešumo rodiklių tyrimus (naudojant senuosius antikoaguliantus). Rekomenduojama išplėsti kompensuojamų vaistų, gydant PV, sąrašą įtraukiant naujosios kartos oralinius antikoaguliantus.

Klinikinėje praktikoje rekomenduojama atkreipti dėmesį į geresnę širdies nepakankamumo simptomų kontrolę, nes stipriau išreikšti ŠN simptomai susiję su blogesniu GK vertinimu.

Planuojant ir rengiant ilgalaikės stebėsenos ir sveikatos palaikymo bei gerinimo programas sergant širdies ligomis, tikslinga atsižvelgti į socioekonominius veiksnius, tokius kaip išsilavinimas, pajamos bei šeimos reikšmė žmogaus gyvenime.

Teikiant sveikatos priežiūros paslaugas PV sergantiems pacientams ir vertinant jų kokybę, tikslinga atminti, kad pacientų gyvenimo kokybės vertinimui turi įtakos ne tik medicininiai ir sociodemografiniai veiksniai, bet ir vidiniai psichologiniai sveikatos ištekliai, iš kurių vienas iš svarbiausių yra ligonio vidinės darnos lygis. Vidinės darnos lygis gali būti stiprinamas bet kuriame amžiaus tarpsnyje.

Gyvenimo aprašymas

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PAREIGOS, DARBOVIETĖ, DARBO PATIRTIS	
Nuo 2009 09	VU MF, Slaugos ir vidaus ligų pagrindų katedra, asistentė. Nuo 2015 09 01 - lektorė
Nuo 2009 08	VšĮ Vilniaus miesto klinikinė ligoninė, vidaus ligų skyrius, vidaus ligų gydytoja
2009 06 – 2009 08	VšĮ Vilniaus miesto klinikinė ligoninė, vidaus ligų skyrius, gydytoja asistentė
2008 04 - 2010 06	VšĮ Kauno 2-oji klinikinė ligoninė, vyresnioji gydytoja rezidentė
2005 10 – 2009 06	VšĮ Kauno apskrities ligoninė, priėmimo ir skubios pagalbos skyrius, medicinos gydytoja;
2003 08 – 2004 07	VšĮ Lazdijų ligoninė, gydytoja internė;
IŠSILAVINIMAS	
Nuo 2009	Doktorantūros studijos VU MF Slaugos ir vidaus ligų pagrindų katedroje
2004 - 2009 m.	Kauno Medicinos Universitetas, rezidentūros studijos, vidaus ligų specialybė
2003 - 2004 m.	Vilniaus Universiteto Medicinos fakultetas, internatūros studijos
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