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## Quality of life of patients after implantation of a pacemaker

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### SUMMARY

**Introduction.** According to data from 2017 provided by the National Health Fund, nearly 30,000 pacemakers and 10,000 cardioverter-defibrillators have been implanted in Poland so far. Pacemaker implantation alone results in an improvement in the quality of life in approximately 35% of patients. Interest in the subject of quality of life can be seen in researchers from various fields since the middle of the last century. Despite the passing years, the demand for comprehensive research on the quality of life in the group of patients with an implanted pacemaker does not decrease.

**Purpose of research.** The aim of the study was to assess the quality of life of patients after implantation of a pacemaker.

**Material and methods.** The study included 100 patients after implantation of a pacemaker, treated at the SPSK 4 cardiology ward and outpatient clinic in Lublin from January to May 2020. The diagnostic survey method was used, and the WHOQOL-BREF standardized tool was used to collect the research material. The obtained results were compiled in a statistical analysis.

**Results.** It was shown that 64% of patients with implanted pacemakers rated their quality of life as at least good. The result of the self-assessment of health was lower, 41% of respondents scored above the average criterion. The highest results were observed in the domain of the functioning environment, and the lowest in the physical domain.

**Conclusions.** The quality of life of most subjects with an implanted pacemaker is at least at a good level. Self-assessment of patients' health is lower than the overall assessment of the quality of life. In patients with an implanted pacemaker, the quality of life was rated the lowest in the physical domain, and the highest in the aspect of the functioning environment.

**KEY WORDS:** quality of life; pacemaker; resynchronization therapy

## **Introduction**

The heart is an essential organ to ensure proper nutrition of tissues in the human body. Sometimes, however, there are various irregularities in its operation that require proper medical treatment. If the disorder occurs in the form of an inadequate amount or quality of contractions, it may be necessary to implant a device "driving" the heartbeat [5]. The frequency of introducing permanent pacemakers (PPM) increases with age. At the same time, up to 80% of all PPMs are implanted in patients over 65 years of age. Due to the increase in the life expectancy of the population, the number of pacemaker implantation procedures is successively increasing [2].

Despite the enormous progress in the possibilities of electrotherapy and the increasing availability of diagnostics, qualification for implantation of a pacemaker is most often done by holter ECG analysis. At the same time, not always the ECG record is sufficient to know the causes of bradyarrhythmia, its basics and causes as the basic indication for pacemaker implantation. Therefore, the basis for determining indications for pacemaker implantation is the observation of a causal relationship between clinical symptoms and conduction disorders [3, 7]. Recent years have shown that, in addition to assessing the somatic symptoms resulting, among others, from the need for electrostimulation, should also be assessed within the daily functioning of patients in the physical, mental, social and environmental dimensions. This assessment consists of the concept of health-related quality of life. Despite the popularization of research on the quality of life, covering more and more new populations, there is still not enough research on, among others, patients with implanted heart pacemakers. The need to conduct them results from the role that the quality of life plays in assessing the effectiveness of therapeutic activities and other medical services [1, 4].

## **Objective of the work**

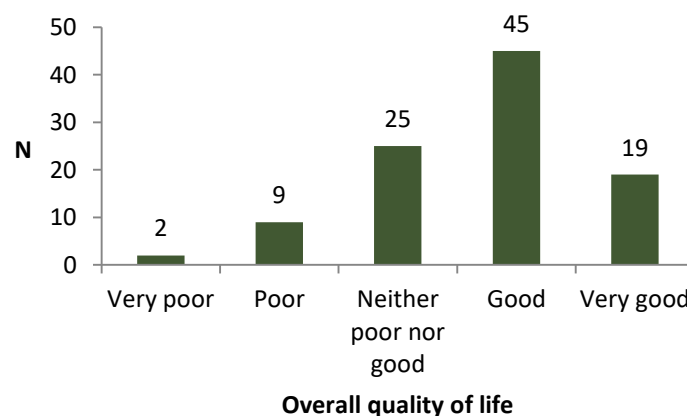
The aim of the study was to assess the quality of life of patients after implantation of a pacemaker.

## Material and methods

The study was conducted from January to the end of May 2020 at the Independent Public Clinical Hospital no. 4 in Lublin and the hospital Polyclinic. 100 patients with an implanted pacemaker were examined, treated in a cardiology department or in a cardiological wound. To conduct the study, the diagnostic survey method was used, and the WHOQOL - BREF standardized tool containing 26 questions for assessing the quality of life in individual domains. The study was conducted with the consent of the respondents, heads of organizational units, and the bioethics commission. The test results were compiled in a statistical analysis, with the significance level being  $p < 0.05$ .

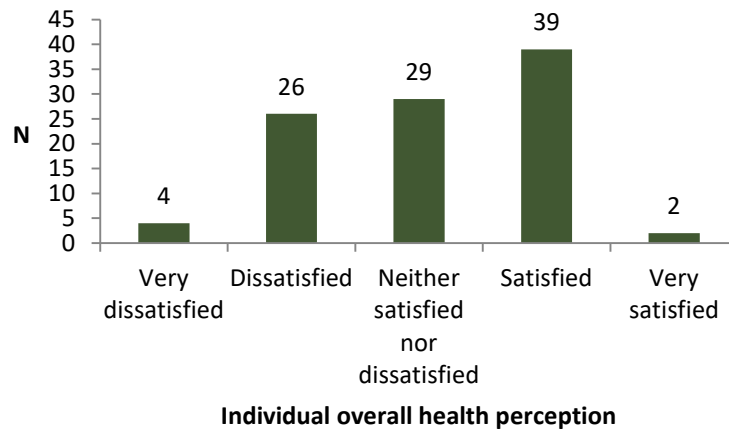
## Results

Below is the level of quality of life of the respondents, measured using the standardized WHOQOL-BREF tool. The results for individual domains of quality of life have been transformed in accordance with the recommendations of the developers of the tool. The achievable results on each scale ranged from 4 to 20. Figure 1 shows the distribution of respondents' answers to the question about their overall quality of life.



**Figure 1. Overall quality of life of the respondents**

Half of the respondents declared that their quality of life was at least good [Me = 4; 95% PU (4, 4)]. The mean result was 4.00 [95% PU (3.83, 4.17)] with a standard deviation of 0.71. The respondents most often declared that their overall quality of life is good. They rarely declared that their quality of life was very bad. Figure 2 presents the distribution of respondents' answers to the question about their self-assessment of health status.



**Figure 2. Self-assessment of the health status of the subjects**

Self-assessment of the health status of more than half of the subjects was higher or equal to the category neither satisfied nor dissatisfied, and it should be mentioned that the 95% confidence interval for the median also contained the category "satisfied" [Me = 4; 95% PU (4, 4)]. The mean result was 3.57 [95% PU (3.46, 3.69)] with a standard deviation of 0.50. Rarely the respondents declared an extreme attitude to their health - that they are very dissatisfied with it or very satisfied. There was no statistically significant difference between these categories.

Table 1. presents a statistical description of the distribution of results obtained by WHOQOL in the somatic, psychological, social and environmental domains.

**Table 1. Results obtained in individual WHOQOL BREF domains**

Field of quality of life	M	Me	SD	SKEW	KURT	min	max	S-W	p
Physical domain	13,71	13,71	3,35	-0,03	-0,96	6,29	20,00	0,971	0,025
Psychological field	14,01	14,67	2,78	-0,36	-0,66	7,33	19,33	0,966	0,011
Field of social relations	14,36	14,67	3,38	-0,39	-0,65	6,67	20,00	0,952	0,001
Operating environment	14,66	15,00	2,44	-0,61	0,06	7,50	19,00	0,966	0,011

M - Medium; Me - median; SD - standard deviation; SKEW - skewness factor; KURT - kurtosis factor; S-W - Shapiro-Wilk test result; p - test probability

The conducted Shapiro-Wilk tests showed statistically significant deviations of the obtained distribution of results from the normal distribution in each of the analyzed domains. The average result obtained by the subjects on the scale of the physical domain was  $13.71 \pm 3$ . The median was also 13.71, which means that half of the subjects obtained a result higher than or equal to 13.71, half lower or equal to this value. The smallest number of points obtained by the respondents was 6.29, while the highest was 20.00. The average result obtained by the respondents on a psychological scale was  $14.01 \pm 2.79$ . The median was 14.67, which means that half of the respondents obtained a result higher than or equal to 14.67, half lower or equal to this value. The smallest number of points obtained by the

respondents was 7.33, while the highest was 19.33. The average score obtained by the respondents on the scale of the field of social relations was  $14.36 \pm 3.38$ . The median was 14.67, which means that half of the respondents obtained a result higher than or equal to 14.67, half lower or equal to this value. The lowest number of points obtained by the respondents was 6.67, while the highest was 20.00. The average result obtained by the respondents on a scale of the field of functioning environment was  $14.66 \pm 2.44$ . The median was 15.00, which means that half of the respondents obtained a result higher or equal to 15.00, half lower or equal to this value. The smallest number of points obtained by the respondents was 7.50, while the highest was 19.00.

## **Discussion**

The general quality of life, which is the main research problem, examined using the WHOQOL-BREF questionnaire, in a group of 100 patients with a pacemaker was assessed as good, with a mean score of  $4 \pm 0.71$  (Me = 4), and at least good for 64% of respondents. It is worth noting that only 11% of patients complained about the poor and very bad overall quality of life. Self-assessment of the health status of the respondents was also characterized by a predominance of "neither satisfied nor dissatisfied" or higher, with an average score of  $3.57 \pm 0.50$  (Me = 4). Extreme values "very dissatisfied" or "very satisfied" occurred only in 6% of cases. Patients with an implanted pacemaker rated their satisfaction with their health condition worse than it was the result of their overall quality of life. The respondents declared the highest quality of life in terms of the functioning environment, while the lowest in the physical domain. Similar conclusions can be found in reports by A. Reczek and K. Kurowska's studies, which concerned the quality of life of 101 patients with diagnosed heart failure. The general perception of the quality of life and self-assessment of the health status of these patients was above average values, resembling the results obtained in our own research. Also, the level of self-assessment of the health status of these patients was lower than the overall assessment of the quality of life. Therefore, it can be suspected that, despite the good quality of life of patients with an implanted pacemaker, it is lower than in the healthy population. In the cited studies, similarly to the own research, the highest results were obtained in the aspect of the functioning environment [6, 8].

## **Conclusions**

1. The overall quality of life assessment shows that in most patients, after implantation of a pacemaker, the quality of life is at least at a good level.
2. In patients with pacemaker implanted, self-esteem of health is lower than the general assessment of the quality of life.
3. The quality of life in the studied group of patients is the lowest in the physical domain and the highest in the environmental domain.

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