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# INFORMING THE PATIENT ABOUT OF IMPLANTABLE CARDIOVERTER DEFIBRILLATORS IN KAZAKHSTAN

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**Abstract**

**Introduction:** The implantable cardioverter defibrillator (ICD) has been implemented in most countries for the treatment of patients at high risk of sudden death from arrhythmia, and has been proven to be effective. To provide high quality care it was identified that system have to patient-oriented. Thus the satisfaction of ICD patients with information about cardioverter-defibrillator implantation one of the crucial issue.

The **aim** is to study the satisfaction of ICD patients with information about technology cardioverter-defibrillator implantation.

**Materials and methods**: The online survey was conducted by phone. The oral consent to participate in the survey was obtained. The survey provided in Russian or Kazakh languages, depending patient preferences. The survey was conducted in the period 2020, among patients who received an ICD in the period from 2017 to 2020 in Almaty city and Kyzylorda region. Statistical processing was carried out using the SPSS 13 software. The Local Ethics Committee of Kazakhstan's Medical University «KSPH» (Almaty, Kazakhstan) approved the study.

**Results:** The high number of Almaty city respondents in comparison of the Kyzylorda region unsatisfactory with the level of the providing information on the effect of ICD (P <0.009), the impact of ICD on driving a car, traveling, playing sports or other activities, what shock means and when they occur, and how daily life might change (P <0.046). Only respondents from Almaty city assessed neutral or unsatisfactory (P <0.004) on informing how to care for a wound after implantation and to manage pain, symptoms and medication when returning home (P <0.002).

**Conclusion:** There are needs to improve in providing information on effects of ICD technology in Almaty city higher in comparison with Kyzylorda region.

***Key words:*** *ICD, patient satisfaction, informing about ICD, efficiency of ICD.*

**Резюме**

# ИНФОРМИРОВАНИЕ ПАЦИЕНТОВ ОБ ИМПЛАНТИРУЕМЫХ КАРДИОВЕРТЕРАХ-ДЕФИБРИЛЛЯТОРАХ В КАЗАХСТАНЕ

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**Введение.** Имплантируемый кардиовертер-дефибриллятор (ИКД) был введен в практику большинства стран для лечения пациентов с высоким риском внезапной смерти от аритмии, что доказало свою эффективность. Для обеспечения высокого качества медицинской помощи было определено, что система должна быть ориентирована на пациента. Следовательно, удовлетворенность пациентов с ИКД информацией об имплантации кардиовертера-дефибриллятора является одним из важных вопросов.

**Цель исследования -** изучить удовлетворенность пациентов с ИКД информацией о технологии имплантации кардиовертера-дефибриллятора.

**Материалы и методы:** Онлайн-опрос проводился по телефону. Было получено устное согласие на участие в опросе. Опрос проводится на русском или казахском языках, в зависимости от предпочтений пациента. Опрос

проводился в период 2020 года среди пациентов, получивших ИКД в период с 2017 по 2020 год в городе Алматы и Кызылординской области. Статистическая обработка проводилась с использованием программного обеспечения SPSS 13. Локальный комитет по этике Казахстанского медицинского университета «ВШОЗ» (Алматы, Казахстан) одобрил исследование.

**Результаты:** Большое число респондентов города Алматы по сравнению с Кызылординской областью неудовлетворительно оценивают уровень предоставления информации о влиянии ИКД (Р <0,009), влиянии ИКД на вождение автомобиля, путешествия, занятия спортом или другие виды деятельности, что означает шок и когда они происходят, и как может измениться повседневная жизнь (Р <0,046). Только респонденты из города Алматы оценили нейтрально или неудовлетворительно (Р <0,004) информацию о том, как ухаживать за раной после имплантации и справляться с болью, симптомами и лекарствами по возвращении домой (Р <0,002).

**Вывод:** Необходимо улучшить предоставление информации о воздействии технологии ИКД в городе Алматы, которая выше по сравнению с Кызылординской областью.

***Ключевые слова**: ИКД, удовлетворенность пациентов, информирование о ИКД, эффективность ИКД.*

**Түйіндеме**

# ҚАЗАҚСТАНДА ИМПЛАНТТЫ КАРДИОВЕРТЕР-ДЕФИБРИЛЯТОРЛАР ТУРАЛЫ ПАЦИЕНТТЕРДІ ХАБАРЛАУ

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**Кіріспе.** Имплантацияланатын кардиовертер дефибрилляторы (ИКД) көптеген елдерде аритмиядан кенеттен қайтыс болу қаупі жоғары науқастарды емдеу үшін енгізілді және тиімді екенін дәлелдеді. Медициналық көмектің жоғары сапасын қамтамасыз ету үшін жүйе пациентке бағытталуы керек екендігі анықталды. Сондықтан ИКД науқастарының кардиовертер-дефибрилляторлы имплантация туралы ақпаратпен қанағаттануы маңызды мәселе болып табылады.

Зерттеудің **мақсаты**-кардиовертер-дефибрилляторды имплантациялау технологиясы туралы ақпаратпен ИКД бар пациенттердің қанағаттанушылығын зерттеу.

**Материалдар мен әдістері**: онлайн-сауалнама телефон арқылы жүргізілді. Сауалнамаға қатысуға ауызша келісім алынды. Сауалнама пациенттің қалауына қарай орыс немесе қазақ тілдерінде жүргізіледі. Сауалнама 2020 жылы Алматы қаласы мен Қызылорда облысында 2017-2020 жылдар аралығында ИКД алған пациенттер арасында жүргізілді. Статистикалық өңдеу SPSS 13 бағдарламалық жасақтамасының көмегімен жүргізілді. "ҚДСЖМ" Қазақстандық медицина университетінің этика жөніндегі жергілікті комитеті (Алматы, Қазақстан) зерттеуді мақұлдады.

**Нәтижелері**: Алматы қаласы респонденттерінің көпшілігі Қызылорда облысымен салыстырғанда ИКД-ның әсері (Р <0,009), ИКД-ның автомобиль жүргізуге, саяхатқа, спортпен шұғылдануға немесе басқа да қызмет түрлеріне әсері туралы ақпарат беру деңгейін қанағаттанарлықсыз бағалайды, шок деген нені білдіреді және ол қашан орын алады және күнделікті өмір қалай өзгереді (Р <0,046). Тек Алматы қаласының респонденттері имплантациядан кейін жараны қалай күту және үйге қайтып келгенде ауырсынуды, симптомдарды және дәрі-дәрмектерді қалай жеңу туралы ақпаратты бейтарап немесе қанағаттанарлықсыз деп бағалады (Р <0,004).

**Қорытынды**: Алматы қаласында ИКД технологиясының әсері туралы ақпарат беруді жақсарту қажет, ол Қызылорда облысымен салыстырғанда жоғары.

***Түйінді сөздер**: ИКД, пациенттердің қанағаттануы, ИКД туралы хабарлау, ИКД тиімділігі.*

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**Introduction**

Over the past decade, cardiovascular disease (CVD) has been one of the leading causes of death worldwide; in 2016, CVD mortality accounted for 31% of all deaths in the world, of which 85% of deaths are caused by heart attack and stroke [9,24]. In Unites states of America a third of deaths from cardiovascular diseases occur before the age of 75, in Europe before 70 years, more than 2,200 Americans die from CVD every day, in Europe every year 60 million potential life years are lost due to cardiovascular diseases [20, 27]]. In Central Asia, the burden of coronary artery disease showed significantly higher age-standardized rates than global levels [14]. Although the age-standardized rates of cardiovascular disease (CVD) are significantly higher in men, the disease has the most serious impact in women worldwide, as it is the leading cause of death in women and one of the most common causes of lost disability-adjusted life years [29].

Implantable cardioverter defibrillators (ICDs) reduce mortality in patients implanted for primary and secondary prevention of sudden cardiac death [13]. The development of the ICD began in the late 1960s, while the ICD was first installed in 1980 [19,11]. Since this period, a number of studies have been carried out confirming the effectiveness and efficiency of this technology [23, 16, 28, 25]. ICD plays an important role in the treatment of ventricular tachyarrhythmias and prevention of sudden cardiac death [6, 3], and among patients with noninfectious cardiomyopathy and ejection fraction ≤35% significantly improved survival [2].

ICD is cost-effective in UK at a threshold of £30 000 per quality adjusted life year (QALY) [18], the additional cost of QALY saved 46,729,026 Colombian pesos in Colombia, 246,016 Mexican pesos in Mexico and US $ 1,213,614 in Uruguay in Uruguay [7].

According to the European Heart Rhythm Association, 105,730 ICD surgeries were performed in 2555 centers in 2016. At the same time, the average number of centers increased from 2.38 in 2015 to 2.65 per million population in 2016, with an approximately equal average number of ICDs per million inhabitants: 101 in 2016 and 102 in 2015 [22]. In Kazakhstan the contingent of patients to whom cardioverter-defibrillators are implanted, men predominate (83.9%), women account for 16.1%, as a rule, patients were admitted to the hospital for emergency medical care (60.2%), days of hospitalization consist averaged 10.8 ± 2.93 [1, 15].

Patient-centered care in health care is defined as providing care that is consistent with the values, needs and desires of patients and is achieved when clinicians engage patients in discussions and decisions about health issues [5,17]. An increase in ICD surgical interventions is observed annually, and one of the tasks is to provide patients and family members with the information necessary to participate in future decisions about the end of the life of their device and other aspects [4,12].

The **aim** is to study the satisfaction of ICD patients with information about technology cardioverter-defibrillator implantation.

**Materials and methods.** In order to implement the set tasks, we have developed a questionnaire for patients with the aim of studying the issues of informing patients about ICD. The questionnaire is adapted from the study by Pedersen S. co-authors [21]. Due to the epidemiological situation associated with COVID-19, the survey was conducted by phone. The patient's oral consent to participate in the survey was previously obtained. With the patient's consent, the survey was recorded, but not all patients agreed to the recording. The survey was conducted in the language preferred by the patient himself, Russian or Kazakh. The survey was conducted in the period 2020, among patients who received an ICD in the period from 2017 to 2020 in Almaty city and Kyzylorda region. Initially, it was planned to conduct a face-to-face survey, however, due to the epidemiological situation related to COVID, the results of an online survey were provided. It was also impossible to complete the survey of four respondents due to poor telephone connection.

Statistical processing was carried out using the SPSS 13 software (IBM, USA). The variables are presented as the median Me [Q1, Q3]. The analysis of frequency characteristics of qualitative indicators was carried out using nonparametric methods using the Pearson criterion ($\chi 2$). Differences in the data were considered statistically significant at $p < 0.05$.

The Local Ethics Committee of Kazakhstan's Medical University «Higher School of Public Health» (Almaty, Kazakhstan) approved the study.

**Results**

The Almaty city 20.6% and Kyzylorda region 6.7% respondents indicated neutral or unsatisfactory level of providing information on the effect of ICD (P <0.009).

More than a third of the respondents assessed neutral or unsatisfactory level of the received information about the impact of ICD on driving a car, traveling, playing sports or other activities: in Almaty city 33.4% (not satisfied (14.6%) or little dissatisfied (4.2%) neutral (14.6%)) and that of the Kyzylorda region 20.0% (not satisfied (6.7%) or little dissatisfied (13.3%)) (P <0.021). Only 39.7% of respondents are satisfied with the knowledge they received about what shock means and when they occur, where the participants in Almaty rated 12.5% as neutral and 62.5% (not satisfied (45.8%) or little dissatisfied (16.7%)) as unsatisfactory, while the respondents from Kyzylorda oblast totaled 13, 4% (not satisfied (6.7%) or little dissatisfied (6.7%)) (P <0.001) and how daily life might change (not satisfied (6.7%) or little dissatisfied (13.3%) neutral (6.7%)) (P <0.046). A negative trend is that only 10.4% of the respondents in Almaty and 46.6% of the Kyzylorda region (P <0.001) assessed satisfactorily the information about what a family member or patient should expect in case of shock, as well as with whom it will be possible to contact when the state of shock occurs in the Kyzylorda region was 86.7% and in Almaty 33.4% (P <0.004).

Only respondents from Almaty indicated neutral or unsatisfactory 27.1% (not satisfied (10.4%) or little dissatisfied (4.2%) neutral (12.5%)) (P <0.004) on informing how to care for a wound after implantation and to manage pain, symptoms and medication when returning home 27.1% (not satisfied (8.3%) or little dissatisfied (4.2%) neutral (14.6%) (P <0.002) (see table 1).

*Table 1.*

**Informing Patients About Cardioverter Defibrillator Implantation.**

| | | Kyzylorda region | Almaty city | Total | P < | Male | Female | Total | P < |
|---|---|---|---|---|---|---|---|---|---|
| | | N (%) | N (%) | N (%) | | N (%) | N (%) | N (%) | |
| Reasons for getting an ICD | neutral | | 1 (2,1) | 1 (1,6) | 0,156 | 1 (2,1) | | 1 (1,6) | 0,670 |
| | satisfied enough | | 9 (18,8) | 9 (14,3) | | 6 (12,5) | 3 (20,0) | 9 (14,3) | |
| | very satisfied | 15 (100,0) | 38 (79,2) | 53 (84,1) | | 41 (85,4) | 12 (80,0) | 53 (84,1) | |
| | Total | 15 (100,0) | 48 (100,0) | 63 (100,0) | | 48 (100,0) | 15 (100,0) | 63 (100,0 | |
| How ICD works | Not/little satisfied | | 2 (4,2) | 2 (3,2) | 0,275 | | 2 (13.4) | 2 (3.2) | 0,073 |
| | neutral | | 3 (6,3) | 3 (4,8) | | 3 (6,3) | | 3 (4,8) | |
| | satisfied enough | | 8 (16,7) | 8 (12,7) | | 5 (10,4) | 3 (20,0) | 8 (12,7) | |
| | very satisfied | 15 (100,0) | 35 (72,9) | 50 (79,4) | | 40 (83,3) | 10 (66,7) | 50 (79,4) | |
| What are the benefits of ICD | Not/little satisfied | | 4 (8,4) | 4 (6,4) | 0,188 | | 4 (26,7) | 4 (6,4) | 0,003 |
| | neutral | | 3 (6,3) | 3 (4,8) | | 3 (6,3) | | 3 (4,8) | |
| | satisfied enough | | 8 (16,7) | 8 (12,7) | | 5 (10,4) | 3 (20,0) | 8 (12,7) | |
| | very satisfied | 15 (100,0) | 33 (68,8) | 48 (76,2) | | 40 (83,3) | 8 (53,3) | 48 (76,2) | |
| Disadvantages of ICD | Not/little satisfied | | 5 (10,4) | 5 (7,9) | 0,188 | 1 (2,1) | 4 (26,7) | 5 (7,9) | 0,019 |
| | neutral | | 2 (4,2) | 2 (3,2) | | 2 (4,2) | | 2 (3,2) | |
| | satisfied enough | | 8 (16,7) | 8 (12,7) | | 5 (10,4) | 3 (20,0) | 8 (12,7) | |
| | very satisfied | 15 (100,0) | 33 (68,8) | 48 (76,2) | | 40 (83,3) | 8 (53,3) | 48 (76,2) | |
| What to do if an ICD shock occurs | Not/little satisfied | 10 (66,7) | 29 (60,4) | 39 (61,9) | 0,127 | 31 (64,6) | 8 (53,3) | 39 (61,9) | 0,239 |
| | neutral | 4 (26,7) | 6 (12,5) | 10 (15,9) | | 6 (12,5) | 4 (26,7) | 10 (15,9) | |
| | satisfied enough | 1 (6,7) | 6 (12,5) | 7 (11,1) | | 4 (8,3) | 3 (20,0) | 7 (11,1) | |
| | very satisfied | | 7 (14,6) | 7 (11,1) | | 7 (14,6) | | 7 (11,1) | |
| How to move your arm, where is the implant | Not/little satisfied | | 5 (10,5) | 5 (8,0) | 0,092 | 2 (4,2) | 3 (20,0) | 5 (8,0) | 0,278 |
| | neutral | | 2 (4,2) | 2 (3,2) | | 1 (2,1) | 1 (6,7) | 2 (3,2) | |
| | satisfied enough | 2 (13,3) | 19 (39,6) | 21 (33,3) | | 17 (35,4) | 4 (26,7) | 21 (33,3) | |
| | very satisfied | 13 (86,7) | 22 (45,8) | 35 (55,6) | | 28 (58,3) | 7 (46,7) | 35 (55,6) | |
| What is the overall prognosis and how can my condition progress with ICD | Not/little satisfied | 2 (13,3) | 6 (12,5) | 8 (12,7) | 0,699 | 5 (10,4) | 4 (20,0) | 8 (12,7) | 0,293 |
| | neutral | 4 (26,7) | 7 (14,6) | 11 (17,5) | | 10 (20,8) | 1 (6,7) | 11 (17,5) | |
| | satisfied enough | 5 (33,3) | 18 (37,5) | 23 (36,5) | | 15 (31,3) | 8 (53,3) | 23 (36,5) | |
| | very satisfied | 4 (26,7) | 17 (35,4) | 21 (33,3) | | 18 (37,5) | 3 (20,0) | 21 (33,3) | |
| Can ICD Protect Against Heart Attack? | Not satisfied | 4 (26,7) | 7 (14,6) | 11 (17,5) | 0,212 | 9 (18,8) | 2 (13,3) | 11 (17,5) | 0,894 |
| | a little dissatisfied | | 5 (10,4) | 5 (7,9) | | 4 (8,3) | 1 (6,7) | 5 (7,9) | |
| | neutral | 6 (40,0) | 10 (20,8) | 16 (25,4) | | 13 (27,1) | 3 (20,0) | 16 (25,4) | |
| | satisfied enough | 4 (26,7) | 15 (31,3) | 19 (30,2) | | 13 (27,1) | 6 (40,0) | 19 (30,2) | |
| | very satisfied | 1 (6,7) | 11 (22,9) | 12 (19,0) | | 9 (18,8) | 3 (20,0) | 12 (19,0) | |
| Impact of the ICD on the initial condition of the patient | Not satisfied | | 6 (12,5) | 6 (9,5) | 0,009 | 4 (8,3) | 2 (13,3) | 6 (9,5) | 0,950 |
| | a little dissatisfied | 1 (6,7) | 2 (4,2) | 3 ( 4,8) | | 2 (4,2) | 1 (6,7) | 3 (4,8) | |
| | neutral | | 4 (8,3) | 4 (6,3) | | 3 (6,3) | 1 (6,7) | 4 (6,3) | |
| | satisfied enough | 1 (6,7) | 19 (39,6) | 20 (31,7) | | 15 (31,3) | 5 (33,3) | 20 (31,7) | |
| | very satisfied | 13 (86,7) | 17 (35,4) | 30 (47,6) | | 24 (50,0) | 6 (40,0) | 30 (47,6) | |
| How daily life can change | Not satisfied | 1 (6,7) | 8 (16,7) | 9 (14,3) | 0,046 | 7 (14,6) | 2 (13,3) | 9 (14,3) | 0,565 |
| | a little dissatisfied | 2 (13,3) | 2 (4,2) | 4 (6,3) | | 3 (6,3) | 1 (6,7) | 4 (6,3) | |
| | neutral | 1 (6,7) | 5 (10,4) | 6 (9,5) | | 3 (6,3) | 3 (20,0) | 6 (9,5) | |
| | satisfied enough | 1 (6,7) | 18 (37,5) | 19 (30,2) | | 16 (33,3) | 3 (20,0) | 19 (30,2) | |
| | very satisfied | 10 (66,7) | 15 (31,3) | 25 (39,7) | | 19 (39,6) | 6 (40,0) | 25 (39,7) | |
| Impact of ICD on driving a car or other activities that you enjoy | Not satisfied | 1 (6,7) | 7 (14,6) | 8 (12,7) | 0,021 | 6 (12,5) | 2 (13,3) | 8 (12,7) | 0,743 |
| | a little dissatisfied | 2 (13,3) | 2 (4,2) | 4 (6,3) | | 3 (6,3) | 1 (6,7) | 4 (6,3) | |
| | neutral | | 7 (14,6) | 7 (11,1) | | 5 (10,4) | 2 (13,3) | 7 (11,1) | |
| | satisfied enough | 1 (6,7) | 16 (33,3) | 17 (27,0) | | 15 (31,3) | 2 (13,3) | 17 (27,0) | |
| | very satisfied | 11 (73,3) | 16 (33,3) | 27 (42,9) | | 19 (39,6) | 8 (53,3) | 27 (42,9) | |
| Effect of age on ICD performance | Not satisfied | 5 (33,3) | 15 (31,3) | 20 (31,7) | 0,219 | 14 (29,2) | 6 (40,0) | 20 (31,7) | 0,921 |
| | a little dissatisfied | 1 (6,7) | 4 (8,3) | 5 (7,9) | | 4 (8,3) | 1 (6,7) | 5 (7,9) | |
| | neutral | 4 (26,7) | 7 (14,6) | 11 (17,5) | | 9 (18,8) | 2 (13,3) | 11 (17,5) | |
| | satisfied enough | 3 (20,0) | 21 (43,8) | 24 (38,1) | | 19 (39,6) | 5 (33,3) | 24 (38,1) | |
| | very satisfied | 2 (13,3) | 1 (2,1) | 3 (4,8) | | 2 (4,2) | 1 (6,7) | 3 (4,8) | |

*Table 1 continue.*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| What you need to know about ICD for end-stage heart failure or death | Not satisfied | 7 (46,7) | 11 (22,9) | 18 (28,6) | 0,105 | 14 (29,2) | 4 (26,7) | 18 (28,6) | 0,837 |
| | a little dissatisfied | | 2 (4,2) | 2 (3,2) | | 1 (2,1) | 1 (6,7) | 2 (3,2) | |
| | neutral | 5 (33,3) | 8 (16,7) | 13 (20,6) | | 11 (22,9) | 2 (13,3) | 13 (20,6) | |
| | satisfied enough | 2 (13,3) | 21 (43,8) | 23 (36,5) | | 17 (35,4) | 6 (40,0) | 23 (36,5) | |
| | very satisfied | 1 (6,7) | 6 (12,5) | 7 (11,1) | | 5 (10,4) | 2 (13,3) | 7 (11,1) | |
| How to care for a wound after implantation | Not satisfied | | 5 (10,4) | 5 (7,9) | 0,004 | 4 (8,3) | 2 (13,3) | 6 (9,5) | 0,714 |
| | a little dissatisfied | | 2 (4,2) | 2 (3,2) | | 2 (4,2) | 2 (13,3) | 4 (6,3) | |
| | neutral | | 6 (12,5) | 6 (9,5) | | 8 (16,7) | 2 (13,3) | 10 (15,9) | |
| | satisfied enough | 4 (26,7) | 25 (52,1) | 29 (46,0) | | 20 (41,7) | 5 (33,3) | 25 (39,7) | |
| | very satisfied | 11 (73,3) | 10 (20,8) | 21 (33,3) | | 14 (29,2) | 4 (26,7) | 18 (28,6) | |
| How to manage pain, symptoms, and medication when you get home | Not/little satisfied | | 6 (12,5) | 6 (9,5) | 0,002 | 5 (10,4) | 2 (13,4) | 7 (11,1) | 0,847 |
| | neutral | | 7 (14,6) | 7 (11,1) | | 5 (10,4) | 1 (6,7) | 6 (9,5) | |
| | satisfied enough | 3 (20,0) | 24 (50,0) | 27 (42,9) | | 23 (47,9) | 6 (40,0) | 29 (46,0) | |
| | very satisfied | 12 (80,0) | 11 (22,9) | 23 (36,5) | | 15 (31,3) | 6 (40,0) | 21 (33,3) | |
| What does shock mean when they happen | Not/little satisfied | 2 (13.4) | 30 (62,5) | 32 (50,8) | 0,001 | 23 (47,9) | 9 (60,0) | 32 (50,8) | 0,914 |
| | neutral | | 6 (12,5) | 6 (9,5) | | 5 (10,4) | 1 (6,7) | 6 (9,5) | |
| | satisfied enough | 9 (60,0) | 5 (10,4) | 14 (22,2) | | 11 (22,9) | 3 (20,0) | 14 (22,2) | |
| | very satisfied | 4 (26,7) | 7 (14,6) | 11 (17,5) | | 9 (18,8) | 2 (13,3) | 11 (17,5) | |
| What to expect for your family member or you if shock occurs | Not/little satisfied | 4 (26,6) | 38 (79,9) | 42 (66,7) | 0,001 | 32 (66,7) | 10 (66,6) | 42 (66,7) | 0,902 |
| | neutral | 4 (26,7) | 5 (10,4) | 9 (14,3) | | 6 (12,5) | 3 (20,0) | 9 (14,3) | |
| | satisfied enough | 2 (13,3) | 4 (8,3) | 6 (9,5) | | 5 (10,4) | 1 (6,7) | 6 (9,5) | |
| | very satisfied | 5 (33,3) | 1 (2,1) | 6 (9,5) | | 5 (10,4) | 1 (6,7) | 6 (9,5) | |
| Who can be contacted when a state of shock occurs | Not/little satisfied | 2 (13.4) | 29 (60.4) | 31 (49.2) | 0,004 | 24 (50.0) | 7 (46.6) | 31 (49.2) | 0,729 |
| | neutral | | 3 (6,3) | 3 (4,8) | | 2 (4,2) | 1 (6,7) | 3 (4,8) | |
| | satisfied enough | 3 (20,0) | 7 (14,6) | 10 (15,9) | | 9 (18,8) | 1 (6,7) | 10 (15,9) | |
| | very satisfied | 10 (66,7) | 9 (18,8) | 19 (30,2) | | 13 (27,1) | 6 (40,0) | 19 (30,2) | |

The largest number of female respondents rated the information received about the causes of ICD as satisfactory; among the answers, the female gender prevails at 100.0% compared to 97.9% for the male. Information about how the ICD works is little or completely dissatisfied with 13.4% of female respondent's P <0.073.

The information received about the benefits of ICD was noted neutrally by 6.3% of males, and little or completely dissatisfied by 26.7% of females (P <0.003).

Informing the participants about the deficiencies of the ICD, 6.3% of male and 26.7% of female, P <0.019, indicated neutral or worse, not sufficiently satisfactory. From the presented answer to the question of what to do if a shock from ICD occurs, it was revealed that the largest number were not satisfied with the information received, 60.3% (of which 53.3% were female and 64.6 male). 6.3% of male and 26.7% of female were not satisfied with the information received on how to move the arm, where the implant is located (P <0.278). What the prognosis and course of the disease with ICD and possible progression might be, 17.5% gave a neutral assessment (20.8% prevail among males, compared with 6.7% for females). 12.7% are not satisfied with the information received (female 20.0% and male 10.4% (P <0.293)). 25.4% rated it as neutral and 25.4% as insufficiently satisfactory in informing the question regarding the possibility of protecting the ICD from heart attack. Of these, 27.1% of male and 20.0% of female gave a neutral assessment, as well as 27.1% of male and 20.0% of female were not satisfactory enough (P <0.894). The largest number of respondents gave a satisfactory assessment of the information they received about the impact of ICD on the initial state of the respondent 81.3% male and 73.3% female. When studying the question of satisfaction with the information received about the effect of ICD on driving a car, traveling, playing sports, having sex, or engaging in other activities, 29.2% of male and 33.3% of female rated it as neutral and worse (P <0.743).

More than a third of respondents, 31.3% of male and 33.4% of female, rated the information received as not satisfactory what to know about ICD for end-stage heart failure or death (P <0.837). On a positive note, 79.2% of male and 80.0% of female are satisfied with the knowledge of how to care for a wound after implantation and manage pain, symptoms and medication after returning home.

A negative trend is a low assessment of satisfaction of only 41.7% of men and 33.3% of female with the knowledge received about what shock means and when they occur (P <0.914), as well as the information provided about what to expect a family member or to the patient with the occurrence of a state of shock in 20.8% of men and 13.4% of female. Only 45.9% of men and 46.1% of female (P <0.729) were satisfied with the knowledge that something can be done to minimize the number of non-critical blows or shock.

**Discussion**

The role of communication in providing patient-centered care has been proven in various studies, especially for patients with ICD, who may experience negative effects associated with technology. Our results represent the first study in Kazakhstan to examine patient participation in decision-making in therapy. Studies on informing patients

with ICD presented by international authors note the importance of informing patients about the possible positive and negative effects of ICD, such as the occurrence of sudden shock, or about stopping the activity of the ICD [21,26]. Four topics were noted that must be voiced and explained without fail to the patient: the installation of an ICD for heart failure can seriously disrupt the lives of patients; patients had a positive but unrealistic view of the ICD; patients had negative / ambivalent opinions about ICD; medical decision making included aspects of participatory decision making and informed consent. Patients without ICD felt less benefit and were less supportive of decision making, therefore interventions needed should include the development and validation of processes for making informed decisions about ICD [10,8].

In the study of informing patients about ICD, in general, there is a positive trend among the respondents of the Kyzylorda region in comparison with the city of Almaty. Accordingly, primary care providers, in conjunction with the inpatient service, should strengthen their efforts to educate patients about ICD, possibly through the development of joint strategies. The study of informing patients about ICD revealed insufficient information among female representatives about the advantages of ICD (P <0.003), and its disadvantages (P <0.019).

In addition, there were no statistically significant results in informing patients about the reasons for receiving ICD (P <0.156), how the ICD works (P <0.275), about the advantages of ICD and its disadvantages (P <0.188), what to do if shock from ICD occurs (R <0.127), how to move the arm, where the implant is located (P <0.092), prognosis and course of the disease with ICD and possible progression (P <0.699), the ability to protect the ICD from a heart attack (P <0.212), the effect of age on ICD performance ( P <0.219) what to know about ICD for end-stage heart failure or death (P <0.105), however, prior to referring patients for ICD surgery, it is very important to focus the attention of healthcare providers on the above issues and educate patients on all points.

Future direction: guidelines for primary care physicians and nurses should be developed, including sections on ICD patient management, information to raise awareness of ICD I patients. Providing regular training on ICD patient management and new types of ICD for primary care specialist is essential to improve patient management. In order to improve medical literacy among patients with coronary artery disease, it is necessary to include the topic of ICD in patient education programs at the primary care level.

**Conclusion**

The implantation of a cardioverter-defibrillator is one of the effective technologies, however, it is associated with both positive and negative effects. Informing patients about the possible negative consequences, as well as changes in daily life with ICD is important, which is carried out at an insufficient level in Almaty in comparison with the Kyzylorda region.

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*Begisbayev T.S. - this author takes responsibility for all aspects of the reliability and freedom from bias of the data presented and their discussed interpretation*

*Begisbayev T.S., Brimzhanova M.D., Akhtaeva N.S., Toleugali Sh.E. - data collection, analysis, methodology, writing original draft.*

*Kosherbayeva L.K. - scientific management of the study, writing - review & editing.*

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