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Наука и Здравоохранение

Ғылым және Денсаулық Сақтау

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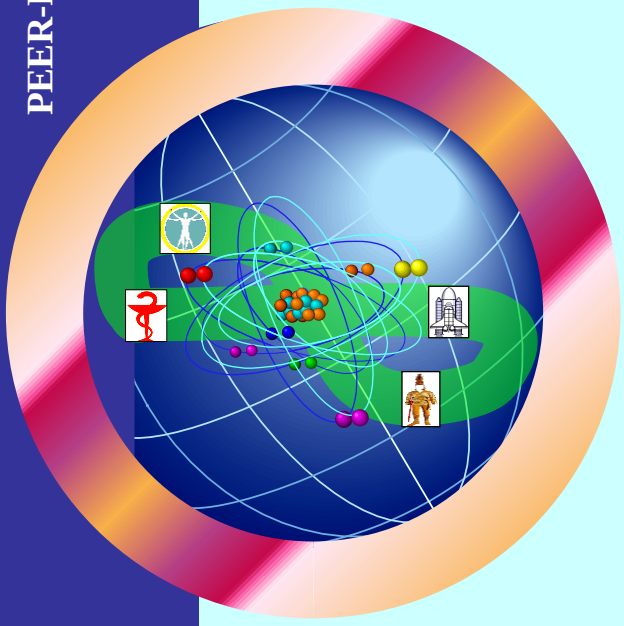

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РЕЦЕНЗИРУЕМЫЙ МЕДИЦИНСКИЙ НАУЧНО-ПРАКТИЧЕСКИЙ ЖУРНАЛ

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RESULTS OF THE IMPLEMENTATION OF THE DISEASE MANAGEMENT PROGRAM ON CHRONIC HEART FAILURE IN THE REPUBLIC OF KAZAKHSTAN

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Abstract

Background. Cardiovascular diseases are the leading cause of death globally, accounting for 20.5 million deaths in 2021, according to the World Heart Report, and accounting for almost a third of all deaths in the world. Many cardiovascular disease events can be prevented by changes in behavioral risk factors, such as smoking and diet, as well as pharmacological interventions. One solution addressing this issue is disease management, which seeks to enhance healthcare by lowering the expenses of treating chronically ill individuals. Disease management programs effectively enhance care quality and adherence, ultimately reducing the misuse of resources.

Aim. To analyze the results of implementing the Disease Management Program in Kazakhstan using chronic heart failure as an example over the years of implementation.

Materials and methods. The necessary statistical data on implementing the Disease Management Program in Kazakhstan were collected using the chronic heart failure example. The research material was the Salidat Kayirbekova National Scientific Research Center for Health Development statistical collections and official reports of the Research Institute of Cardiology and Internal Diseases for 2018-2022.

Results. The introduction of a disease management system for the management of chronic heart failure at the end of 2013-2022 contributed to a decrease in mortality from cardiovascular diseases by 4.3%, including from hypertension by 12%, coronary artery disease by 4%, and acute myocardial infarction by 4.8%. Quality of care within the healthcare system has advanced: patient coverage has expanded, and training sessions have been arranged for patients and healthcare professionals.

Conclusions. These findings highlight the success of the implemented strategies and underscore the importance of continuous monitoring and evaluation to enhance healthcare outcomes further. Overall, the research underscores the positive trajectory of chronic disease management in Kazakhstan, paving the way for future improvements and sustained health benefits for the population.

***Keywords**: disease management program, chronic heart failure, non-communicable diseases, Kazakhstan.*

Резюме

РЕЗУЛЬТАТЫ РЕАЛИЗАЦИИ ПРОГРАММЫ УПРАВЛЕНИЯ ЗАБОЛЕВАНИЯМИ ПО ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ В РЕСПУБЛИКЕ КАЗАХСТАН

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Введение. Сердечно-сосудистые заболевания являются основной причиной смертности во всем мире, на долю которых в 2021 году пришлось 20,5 миллиона смертей и составили почти треть всех смертей в мире (World Heart Report, 2023). Многие случаи сердечно-сосудистых заболеваний можно предотвратить путем изменения поведенческих рисков, в частности по курению и питанию, а также приверженности лечению. Одним из эффективных решений является управление заболеваниями, направленное на улучшение качества ухода за счет сокращения затрат, связанных с лечением хронических больных. Программы управления заболеваниями являются эффективным средством повышения качества ухода, соблюдения рекомендаций и, в итоге, сокращения нецелевого использования ресурсов.

Цель проанализировать результаты реализации Программы управления заболеваниями в Казахстане на примере хронической сердечной недостаточности за годы реализации.

Материалы и методы. Произведен сбор необходимых статистических данных по реализации Программы Управления Заболеваниями в Республике Казахстан на примере хронической сердечной недостаточности. Материалом исследования были: статистические сборники ННЦРЗ имени Салидат Каирбековой МЗ РК за 2013-2022 года и официальные отчеты КазНИИКиВБ за 2018-2023 года.

Результаты. С 2013 по 2022 годы было достигнуто снижение смертности от сердечно-сосудистых заболеваний на 4,3%; включая снижение смертности от заболеваний, связанных с повышением артериального давления на 12%; ишемической болезни сердца на 4% и острого инфаркта миокарда на 4,8%. В рамках программы управления заболеваниями значительно улучшилось качество медицинской помощи: расширился охват пациентов, проведены обучающие курсы, как для пациентов, так и для работников службы здравоохранения.

Заключение. Эти результаты подчеркивают успех реализованных стратегий и подчеркивают важность постоянного мониторинга и оценки для дальнейшего улучшения результатов здравоохранения. В целом, исследование подчеркивает положительную траекторию лечения хронических заболеваний в Казахстане, открывая путь к будущим улучшениям и устойчивым преимуществам для здоровья населения.

***Ключевые слова**: программа управления заболеваниями, хроническая сердечная недостаточность, неинфекционные заболевания, Казахстан.*

Түйіндеме

ҚАЗАҚСТАН РЕСПУБЛИКАСЫНДАҒЫ СОЗЫЛМАЛЫ ЖҮРЕК ЖЕТКІЛІКСІЗДІГІ БОЙЫНША АУРУЛАРДЫ БАСҚАРУ БАҒДАРЛАМАСЫН ІСКЕ АСЫРУ НӘТИЖЕЛЕРІ

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Кіріспе. Жүрек-қан тамырлары аурулары дүние жүзінде өлім-жітімнің басты себебі болып табылады, 2021 жылы 20,5 миллион өлімді құрайды және дүние жүзіндегі барлық өлім-жітімнің үштен бір бөлігін құрайды (World Heart Report, 2023). Жүрек-қан тамырлары ауруларының негізгі оқиғаларын темекі шегу және диета сияқты мінез-құлыққа байланысты қауіп факторларын өзгерту, сондай-ақ дәрі-дәрмектік ем арқылы алдын-алуға болады. Осындай шешімдердің бірі - созылмалы науқастарды емдеуге байланысты шығындарды азайту арқылы медициналық көмекті жақсартуға бағытталған ауруларды басқару. Ауруды басқару бағдарламасы күтім мен сәйкестікті жақсартудың және сайып келгенде ресурстарды орынсыз пайдалануды тежеудің тиімді құралы болып табылады.

Зерттеу мақсаты. Қазақстанда ауруларды басқару бағдарламасын іске асыру жылдарындағы созылмалы жүрек жеткіліксіздігі мысалында нәтижелерін талдау.

Материалдар мен тәсілдер. Созылмалы жүрек жеткіліксіздігі мысалында Қазақстан Республикасындағы ауруларды басқару бағдарламасын іске асыру бойынша қажетті статистикалық деректер жиналды. Зерттеу материалы ретінде Қазақстан Республикасы Денсаулық сақтау министрлігінің Салидат Қайырбекова атындағы Ұлттық ғылыми денсаулықты дамыту орталығының 2013-2022 жылдарға арналған статистикалық жинақтары және "Кардиология және ішкі аурулар ғылыми зерттеу институты" АҚ 2018-2023 жылдарға арналған ресми есептері пайдаланылды.

Нәтижелер. 2013-2022 жылдардың соңында созылмалы жүрек жеткіліксіздігі бойынша ауруды басқару бағдарламасын енгізу жүрек қантамыр аурулары өлім-жітімінің 4,3%-ға, оның ішінде қан қысымының жоғарылауымен байланысты аурулардан 12%-ға, жүрек ишемиялық ауруларынан 4%-ға, миокард инфарктысынан

4,8%-ға төмендеуіне ықпал етті. Денсаулық сақтау жүйесі аясындағы медициналық көмектің сапасы айтарлықтай өзгерді. Денсаулық сақтау жүйесінде мұндай науқастарды қамту ұлғайды, науқастар мен медицина қызметкерлерін оқыту курстары жүргізілді.

Conclusions. Бұл тұжырымдар іске асырылған стратегиялардың табыстылығын және денсаулық сақтау нәтижелерін одан әрі жақсарту үшін үздіксіз мониторинг пен бағалаудың маңыздылығын көрсетеді. Жалпы алғанда, зерттеу Қазақстандағы созылмалы ауруларды басқарудың оң траекториясын көрсетеді, бұл оңтайландыру мен халық денсаулығының тұрақты пайдасы үшін жол ашады.

***Түйінді сөздер**: ауруларды басқару бағдарламасы, созылмалы жүрек жеткіліксіздігі, жұқпалы емес аурулар, Қазақстан.*

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Конысбекова А., Пашимов М., Абикулова А., Сейдуанова Л., Джумагазиева О., Құмар А. Қазақстан Республикасындағы созылмалы жүрек жеткіліксіздігі бойынша ауруларды басқару бағдарламасын іске асыру нәтижелері // Ғылым және Денсаулық сақтау. 2024. Т.26 (6). Б. 56-63. *doi 10.34689/SH.2024.26.6.007*

Introduction.

Chronic heart failure (CHF) remains one of the leading causes of morbidity and mortality worldwide, posing a serious challenge to health systems. This problem is particularly acute in Kazakhstan, where cardiovascular diseases are widespread [2, 6]. Disease management programs (DMPs), started in the Republic of Kazakhstan in 2013, aim to reduce the number of hospitalizations, improve patients' quality of life, and reduce the financial burden on health care [1, 7]. These programs represent a comprehensive approach to treating chronic diseases, including regular condition monitoring, risk factor management, patient education, and the use of medications [3].

According to studies, survival rates have increased recently in many countries [14]. However, the disease remains associated with a high risk of mortality worldwide, with 17% to 45% of hospitalized patients dying within one year (Ponikowski, 2014). In high-income countries, CHF accounts for over 10% of all deaths (Kaur, 2017). This percentage is significantly higher in low- and middle-income countries, where CHF is responsible for 28% of deaths [15]. CHF patients frequently experience a lower quality of life.

Studies suggest that such programs help reduce the risk of complications, improve clinical outcomes, and optimize healthcare resources [4]. Research shows that DMPs can significantly reduce rehospitalizations and improve patient adherence to prescribed therapy. This is especially important in medical institutions with a high workload, where such programs become an important tool for optimizing the work of the healthcare system [17].

As part of the State Health Development initiative "Salamatty Kazakhstan" for 2011–2015, a disease management program was implemented within the framework of measures to develop primary health care. It was piloted in different areas of Kazakhstan to lower the prevalence of controllable diseases and raise public health responsibility [6].

Since 2017, The Research Institute of Cardiology and Internal Diseases (RICID) has been responsible for organizational and methodological support, implementation of measures for the implementation of DMPs in the regions, and quarterly monitoring of DMPs indicators using the Electronic Database of DMPs indicators developed by RICID. Specialists from RICID have developed the concept of a mobile application for patients with healthcare facilities. The “DMP" tab has been added to the DamuMed mobile application. The mobile application lets the patient enter his health data and independently assess his condition.

Doctors of RICID carry out work at the regional level. In pursuance of the order of the Ministry of Health of the Republic of Kazakhstan dated February 13, 2023, No. 91 “On some issues of providing coordination and methodological guidance in the field of healthcare in 2023”, by the approved schedule, in the first half of 2023 specialists from RICID to the regions of the republic. In the country's regions, patients with pathologies of the cardiovascular system were examined, ECG interpretations were performed, and recommendations for examination and treatment tactics were given. Specialists offer telemedicine consultation of patients in emergency cases, with access to JSC Research Institute of Kyiv, and in planned cases, with our specialists visiting the hospital or consultation by the patient’s doctors directly at the institute’s clinic [5].

Training sessions were held as part of Kazakhstan's Disease Management Program, which aims to improve the management of chronic conditions like hypertension, chronic heart failure, and type 2 diabetes. In a mixed format, 5,131 specialists from multidisciplinary teams from 6 regions were trained, including 1,837 doctors and 2,719 paramedical staff.

The study aims to evaluate the outcomes of implementing the Disease Management Program (DMP) in Kazakhstan, with chronic heart failure (CHF) as a focal example, for 2018–2023.

Materials and Methods: Relevant statistical data were gathered to assess the effectiveness of the DMP in Kazakhstan, with a particular emphasis on CHF. A comparative analysis was conducted using mathematical methods to evaluate statistical indicators of morbidity and mortality related to cardiovascular diseases. The analysis

looked at circulatory diseases, such as coronary heart disease, hypertension, and acute myocardial infarction, for the period from 2013 to 2022. Additionally, indicators from reports on the Disease Management Program for 2018–2023 were analyzed.

The primary data sources included official reports from the Republican Information and Computing Information Database (RICID) for 2018–2023 and statistical compilations from the Kayirbekova National Research Center for Health Development under the Ministry of Health of the Republic of Kazakhstan for 2013–2022. The Asfendiyarov Kazakh National Medical University in Almaty, Kazakhstan's Local Ethics Committee (IRB00011496, Protocol No. 5(96) dated May 15, 2020) approved the study.

The materials used were obtained from open sources. Permission for publication was taken from RICID.

Research results.

According to the data presented by the S. Kayirbekova National Research Center for Health Development in the ERDB information system as of December 31, 2023, 2,060,986 patients with hypertension, type 2 diabetes, and CHF registered at the dispensary, of which 1,218,247 patients, or 59.1%, participated in the healthcare system. According to the PHC register, the most significant percentage of patients participating in PHC is observed in the Kyzylorda region (72.8%) and in the city of Shymkent (65.5%) (Table 1).

Table 1.

Percentage of patients participating in health care from dispensaries (as of December 31, 2023).

Region name	Total dispensary patients registered for three nosologies	Total patients involved in DMP	Coverage, %	Total dispensary patients registered for CHF	Total patients involved in DMP CHF	Coverage, %
Akmola	94 800	54094	57,1	6687	3425	51,2
Aktobe	87 375	55283	63,3	4140	2982	72,0
Almaty	171 858	98681	57,4	10256	4126	40,2
Atyrau	49 775	29928	60,1	1358	983	72,4
West Kazakhstan Oblast	89 351	42087	47,1	2944	1160	39,4
Zhambyl	99 393	62719	63,1	3109	1816	58,4
Karaganda	184 690	117856	63,8	12370	4580	37,0
Kostanay	106 560	60701	57,0	5211	2569	49,3
Kyzylorda	72 128	52515	72,8	3767	5326	141,4
Mangystau	54 448	24860	45,7	2734	698	25,5
Turkestan	198 581	121016	60,9	10259	5608	54,7
Pavlodar	103 454	65356	63,2	6675	3024	45,3
North Kazakhstan Oblast	96 754	65069	67,3	9639	4797	49,8
East Kazakhstan Oblast	223 143	120979	54,2	27972	12657	45,2
Astana city	105 675	62386	59,0	8608	4278	49,7
Almaty city	223 267	117116	52,5	17896	7745	43,3
Shymkent city	99 734	65298	65,5	5323	2376	44,6
TOTAL	2 060 986	1 215 944	59,0	138 948	68 150	49,0

138,948 chronic heart failure patients are registered at the dispensary, of which 68,873, or 49.6%, participate in the healthcare system. Of the eligible patients with CHF (68,150 people), 54% (40,018 people) completed the second visit (Table 2). Low visit coverage is observed in the East Kazakhstan region (14.5%) and Akmola (39.3%).

According to the PHC register, 760 patients received inpatient treatment for decompensated CHF, which amounted to 1.4% (Table 2). The most significant number of hospitalizations of patients with CHF is observed in KZO 76 cases (4.5%) and in Zhambyl 58 (4.3%) regions.

In dynamics, the survey coverage is increasing (determination of creatinine from 72.6% to 77.3%).

The introduction of DMPs in the Republic of Kazakhstan gave positive results in patients involved in PHC with three nosologies (Hypertension, Diabetes, CHF), which made it possible:

- in patients with hypertension, stabilize blood pressure levels in 80.2% of patients, improve blood pressure control and regularity of taking antihypertensive drugs, increase the proportion of patients with hypertension who achieve the target LDL level <2.5 mmol/l in 21.3%;

- in patients with diabetes, increase the proportion of patients with a decrease in the control level of glycated hemoglobin (HBA1C ≤ 7) in 25.7%;

- In patients with CHF, emergency hospitalization for decompensation decreased in 760 patients, which amounted to 1.4%.

Table 2.

Total number of second visits to the health center with chronic heart failure and hospitalized patient with decompensation for 2018-2023.

years	completion of the second visit	Abs. number of hospitalized	%
2018	13205	354	6,7
2019	13913	417	3
2020	18711	430	2,3
2021	33066	661	2
2022	36816	699	1,9
2023	40018	760	1,4

By the end of 2018, it was possible to achieve a significant reduction in mortality from cardiovascular diseases (CVD) by 4.3%. In particular, mortality from

arterial hypertension decreased by 12%, from coronary heart disease – by 4%, from acute myocardial infarction – by 4.8%, and from stroke – by 8%. Also, the overall reduction in mortality from CVD was 2.6%, from acute myocardial infarction – 3.4%, and stroke – 2.3%. PHC organizations have also noticed a reduction in workload and wait times, an increase in the accessibility of sufficient medication, and a rise in patient accountability due to self-management and self-care.

Up to 47.6% of patients are provided free essential medications (ACE inhibitors/Sartans up to 49.3%, beta-blockers up to 45.8%). In 2018, the % of patients with CHF taking B-blockers were 79.6%. In Table 3, you can see that the relative proportion of patients needing medication is decreasing. This may be due to compensation for the disease.

Table 3.

Percentage of patients provided with free essential drugs for 2018-2023.

years	Beta-blockers	ACE inhibitors/sartans
2018	79,6	81,3
2019	66	66,1
2020	58,4	60,1
2021	51,5	54,3
2022	45,8	49,3
2023	45	48

In dynamics, coverage in the survey is increasing (definition of EF from 78.1% to 83.5%, creatinine from 84.4% to 92.4%). In contrast, in areas with low coverage of visits to East Kazakhstan region and Akmola, low coverage in the survey is also noted: in the Akmola region, on the first visit out of 491 patients with CHF, EF was determined in 37.1%, on the second visit out of 193 - 56.5%, in the East Kazakhstan region, out of 2032 patients, 43.7% had an echocardiography study on the 1st m visit, on visit 2 out of 295 patients, 55.9% were covered by echocardiography examination.

We then compared primary morbidity and mortality rates from circulatory system diseases in the Republic of Kazakhstan's population from 2013 to 2022 [8, 9].

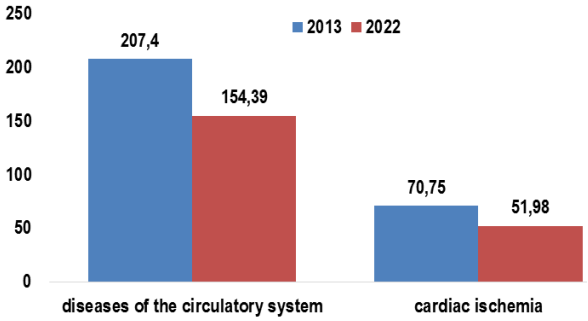

Figure 1. Dynamics of mortality rates from cardiovascular diseases for 2013-2022.

An analysis of the country's ten-year dynamics after introducing DMPs shows decreased mortality rates from circulatory system diseases, including ischemic heart disease (Figure 1). However, as can be seen from Figure 1, the incidence of cardiovascular diseases that often lead to chronic heart failure, such as acute myocardial infarction, hypertension, and ischemic heart disease, showed an increase in the period from 2013 to 2022 [8, 9].

An annual increase in incidence is recorded for all three presented nosologies:

Hypertension in 2013: 1665.9 cases per 10,000 populations; in 2022: 1803.6 cases. The prevalence varies from 15 to 27% (according to various sources).

- coronary heart disease in 2013 – 500.6 cases per 10,000 populations, in 2022 – 585.1 cases.

- acute myocardial infarction in 2013 – 57.5 cases per 10,000 populations, in 2022 – 121.5 cases.

These dynamics may be associated with improved diagnosis of CVD and detection of patients with such diagnoses, implementation of screening programs for target population groups, and routine coronary angiography.

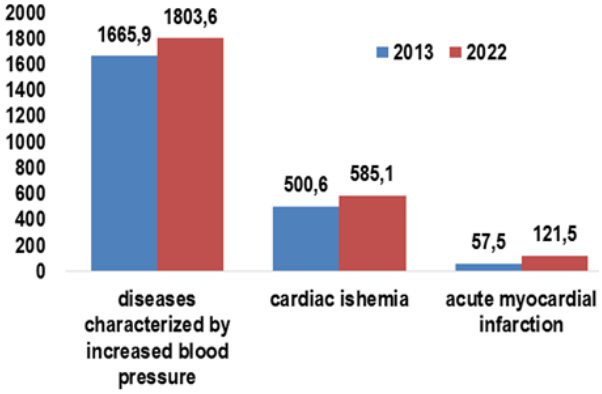

Figure 2. Dynamics of morbidity rates from cardiovascular diseases for 2013-2022.

At the end of 2023, we see positive dynamics in several key process indicators: the number of patients in healthcare facilities increased to 1,218,247, which amounted to 59.1% of dispensary groups.

Discussion

Most therapeutic plans for treating cardiovascular diseases include DMP`s approach, the effectiveness of which has been confirmed by randomized controlled trials demonstrating its significant therapeutic benefits [18]. The parts of a disease management program can be defined using the proposal to classify the standard components of such programs.

Effective management of heart failure involves much more than just gathering physiological data; it also involves stimulating or supporting each disease management component. A methodical strategy for home monitoring involves regular evaluations of the best ways to prescribe medications and continuous support of patient and caregiver education [9].

The available research on the impact of Disease Management Programs (DMPs) on expenses, care quality, and health outcomes remains inconclusive [10, 11, 15]. For example, programs that follow evidence-based guidelines for heart failure care have produced mixed outcomes. While some have reduced post-hospital mortality, many patients in these programs did not have chronic heart failure [12]. Some DMPs have been cost-effective by lowering hospitalization rates, although the results are inconsistent. Similarly, research on disease management programs for chronic conditions, such as diabetes and heart disease,

shows conflicting results, with some programs achieving significant cost savings while others do not [3].

Gregory et al. highlighted the economic impact of a tertiary heart failure treatment program, focusing on patients evaluated for heart transplantation. Transplant patients incurred higher hospitalization rates and costs compared to non-transplant patients. Despite the higher costs, the program has significantly improved patient survival and quality of care, which not only meets their needs but may also attract new patients, helping to increase hospital revenue and improve the standard of care for heart failure [14]. Studies have shown that DMPs significantly reduce medical costs for individuals with ongoing health conditions. This reduction stems from better personal health maintenance, fewer returns to hospitals, reduced emergency department usage, and overall lower healthcare utilization [15].

Research focusing on the REMADHE initiative, conducted by Bocchi EA and colleagues in 2018, demonstrated superior outcomes and cost reductions compared to standard heart failure treatments. The initiative generated average cost reductions of $7,345, with statistical analysis showing the strong probability of financial efficiency. The program has shown particular value for specific categories of patients, particularly men over 50 with severe cardiac symptoms and reduced cardiac pumping function [17, 18].

In a separate analysis by Woorim Kim's team (2021), health monitoring systems proved financially beneficial for blood pressure management in middle-aged and older populations. Their findings emphasized establishing streamlined healthcare protocols for these patients [22].

The positive impact of these health management initiatives extends beyond financial metrics. Participants report enhanced wellness indicators, particularly among elderly cardiac patients. Notable improvements included reduced exhaustion levels, better psychological health, and increased autonomy in managing their conditions [17, 19].

Patient adherence to treatment plans is a significant issue in illness management. Adherence variations could result from patients holding their own and attempting to elude the DMPs' modifications or patients who do not fully trust the program [23].

A significant challenge lies in ensuring patients follow prescribed treatment regimens. Resistance may stem from individual preferences or skepticism about program effectiveness. Healthcare systems often implement reward structures to boost participation, including medication discounts and reduced payment requirements. Medical providers sometimes hesitate due to concerns about revenue reduction, though evidence suggests long-term benefits outweigh initial costs [4, 20].

These initiatives face several implementation hurdles, particularly in cardiac care. Challenges include intensive monitoring requirements, medication complexity, and cognitive limitations in some patients. Success demands comprehensive support systems and vigilant oversight [19].

Future developments require expanded research into cost-benefit ratios and long-term effectiveness. Current programs vary widely in their approaches, making direct comparisons difficult. Implementation success depends on addressing practice variations, treatment continuity issues, and establishing clear evidence bases [22].

Healthcare professionals and patients must make behavioral changes to achieve optimal results, which requires regular updates, educational programs, and systematic reminders. Programs must balance implementation costs against quality improvements and stakeholder satisfaction [12, 13].

Critical success factors include patient self-management capabilities and healthcare provider adherence to established protocols. Performance monitoring systems are crucial in maintaining program effectiveness and ensuring sustainable positive outcomes.

The ability of patients to control their disease and the adherence of healthcare professionals to standards of care are critical components of the DMP's success. One tactic to guarantee the sustainability of results could be to implement an indicator system to gauge the efficacy and results of an intervention [14].

Our study presents data from a comprehensive national register, which includes a large sample size of patients with chronic conditions like hypertension, type 2 diabetes, and CHF. This broad data set provides a more accurate and generalizable understanding of healthcare trends across Kazakhstan. The study provides a ten-year dynamic analysis, allowing for an in-depth look at trends in mortality and morbidity rates and the impact of disease management programs over time.

As a limitation, the study presents data on the number of hospitalizations for decompensated CHF, but this may be influenced by the fact that more patients with severe symptoms are being detected and treated. This could give the impression of worsening disease trends, which may not reflect actual disease progression.

While the study demonstrates a decrease in mortality rates from CHF and improvements in patient management, it does not delve into the causal factors behind the observed trends. For instance, the increase in the incidence of CHF could be due to better diagnosis rather than a true rise in disease prevalence.

In summary, the heart failure disease management program has been shown to reduce mortality and hospitalizations and is an integral part of clinical guidelines. The DMP design should use proven treatments, patient education, cause-specific diagnosis, and easy access during clinical deterioration.

Since its launch, Kazakhstan's disease control program has yielded positive shifts in public wellness metrics. These advancements in managing medical conditions, mainly through disease management programs and improvements in healthcare infrastructure, have significantly strengthened the overall health and well-being of Kazakhstan's citizens. As a result, the nation has seen an increase in life expectancy, with more people living healthier lives. Moreover, these improvements contributed to raising the standard of living in the country by reducing the burden of chronic diseases, improving access to health care, and encouraging healthier lifestyles. The overall impact was positive, leading to improved quality of life, increased productivity, and a more sustainable health system in

Kazakhstan. Key health indicators improved, and the DMP framework improved the quality of health services.

Conclusion.

In conclusion, the regional efforts led by the doctors of RICID under the guidance of the Ministry of Health of the Republic of Kazakhstan have demonstrated a significant impact on healthcare delivery and chronic disease management. These findings highlight the success of the implemented strategies and underscore the importance of continuous monitoring and evaluation to enhance healthcare outcomes further. Overall, the research underscores the positive trajectory of chronic disease management in Kazakhstan, paving the way for future improvements and sustained health benefits for the population.

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