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IMPROVING THE ORGANIZATION OF ONCOLOGY CARE FOR URBAN POPULATIONS

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Introduction. Oncological diseases remain one of the most important medical and social challenges. In Kazakhstan, the number of newly registered cancer cases exceeded 38,000 in 2023, while the demand for oncology services in urban settings continues to grow.
Objective. To review the current organization of oncology care for urban populations, compare relevant international approaches, and identify priority directions for improving oncology care in Kazakhstan.
Materials and Methods. A structured narrative review of the 25 sources cited in the manuscript was performed. The evidence base included peer-reviewed publications, international cancer statistics, national statistical reports, methodological recommendations, and policy documents. The material was synthesized thematically with emphasis on screening, early diagnosis, service organization, infrastructure, and international experience.
Results. The experience of Japan and South Korea demonstrates the organizational value of population-based screening, high participation, and the use of endoscopic methods for early detection of gastric cancer. Kazakhstan has implemented national screening programs, infrastructure modernization, telemedicine, and cancer-registry development; however, regional differences, workforce limitations, and unequal access to specialized care remain relevant.
Discussion. The reviewed evidence indicates that improvement of urban oncology care requires coordinated screening pathways, modern diagnostic and treatment capacity, multidisciplinary management, reliable cancer data, and psychosocial support. International models can inform national practice, but their implementation should be adapted to the structure and resources of Kazakhstan's healthcare system.
Conclusion. A comprehensive and sustainable approach that combines early detection, modern technologies, organizational integration, workforce development, and patient-centered support is required to improve the accessibility and quality of oncology care for urban populations.
Keywords: malignant tumor; early diagnosis; screening; oncology care; healthcare organization.

СОВЕРШЕНСТВОВАНИЕ ОРГАНИЗАЦИИ ОНКОЛОГИЧЕСКОЙ ПОМОЩИ ГОРОДСКОМУ НАСЕЛЕНИЮ

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Введение. Онкологические заболевания остаются одной из наиболее значимых медико-социальных проблем. В Казахстане в 2023 году число впервые зарегистрированных случаев рака превысило 38 тысяч, а потребность в онкологической помощи в городах продолжает возрастать.
Цель. Рассмотреть современную организацию онкологической помощи городскому населению, сопоставить релевантные международные подходы и определить приоритетные направления совершенствования онкологической помощи в Казахстане.
Материалы и методы. Проведен структурированный нарративный обзор 25 источников, представленных в рукописи. Доказательная база включала рецензируемые публикации, международную онкологическую статистику, национальные статистические материалы, методические рекомендации и документы государственной политики. Материал систематизирован по вопросам скрининга, ранней диагностики, организации службы, инфраструктуры и международного опыта.
Результаты. Опыт Японии и Южной Кореи показывает организационную значимость популяционного скрининга, высокой приверженности обследованию и применения эндоскопических методов для раннего выявления рака желудка. В Казахстане реализуются национальные скрининговые программы, модернизация

инфраструктуры, телемедицина и развитие канцер-регистров, однако сохраняются региональные различия, кадровые ограничения и неравномерная доступность специализированной помощи.
Обсуждение. Обобщенные данные показывают, что совершенствование городской онкологической помощи требует согласованных маршрутов скрининга, современной диагностической и лечебной базы, мультидисциплинарного ведения, надежных онкологических данных и психосоциальной поддержки. Международные модели могут использоваться как ориентир, но требуют адаптации к структуре и ресурсам системы здравоохранения Казахстана.
Заключение. Для повышения доступности и качества онкологической помощи городскому населению необходим комплексный устойчивый подход, объединяющий раннее выявление, современные технологии, организационную интеграцию, развитие кадрового потенциала и пациент-ориентированную поддержку.
Ключевые слова: злокачественная опухоль; ранняя диагностика; скрининг; онкологическая помощь; организация здравоохранения.

ҚАЛАЛЫҚ ТҰРҒЫНДАРҒА ОНКОЛОГИЯЛЫҚ КӨМЕКТІ ҰЙЫМДАСТЫРУДЫ ЖЕТІЛДІРУ: ҚҰРЫЛЫМДАЛҒАН НАРРАТИВТІК ШОЛУ

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Кіріспе. Онкологиялық аурулар маңызды медициналық-әлеуметтік мәселелердің бірі болып қала береді. Қазақстанда 2023 жылы қатерлі ісіктің алғаш тіркелген жағдайлары 38 мыңнан асты, ал қалалық жерлерде онкологиялық көмекке қажеттілік артып келеді.
Мақсаты. Қалалық тұрғындарға онкологиялық көмекті ұйымдастырудың қазіргі жағдайын қарастыру, халықаралық тәсілдерді салыстыру және Қазақстандағы онкологиялық көмекті жетілдірудің басым бағыттарын анықтау.
Материалдар мен әдістер. Қолжазбада келтірілген 25 дереккөзге құрылымдалған нарративтік шолу жүргізілді. Дәлелдер базасына рецензияланатын ғылыми жарияланымдар, халықаралық онкологиялық статистика, ұлттық статистикалық материалдар, әдістемелік ұсынымдар және мемлекеттік саясат құжаттары енгізілді. Материал скрининг, ерте диагностика, қызметті ұйымдастыру, инфрақұрылым және халықаралық тәжірибе бағыттары бойынша жүйеленді.
Нәтижелер. Жапония мен Оңтүстік Корея тәжірибесі популяциялық скринингтің, тексеруге жоғары қатысудың және асқазан обырын ерте анықтауда эндоскопиялық әдістердің ұйымдастырушылық маңызын көрсетеді. Қазақстанда ұлттық скринингтік бағдарламалар, инфрақұрылымды жаңғырту, телемедицина және канцер-регистрлерді дамыту жүзеге асырылуда, алайда өңірлік айырмашылықтар, кадрлық шектеулер және мамандандырылған көмектің біркелкі қолжетімсіздігі сақталуда.
Талқылау. Жинақталған деректер қалалық онкологиялық көмекті жетілдіру үшін скрининг маршруттарын үйлестіру, заманауи диагностикалық және емдеу мүмкіндіктерін дамыту, мультидисциплинарлық тәсілді күшейту, сенімді онкологиялық деректер мен психоәлеуметтік қолдауды қамтамасыз ету қажет екенін көрсетеді. Халықаралық модельдер ұлттық практикаға бағдар бола алады, бірақ олар Қазақстан денсаулық сақтау жүйесінің құрылымы мен ресурстарына бейімделуі тиіс.
Қорытынды. Қалалық тұрғындарға көрсетілетін онкологиялық көмектің қолжетімділігі мен сапасын арттыру үшін ерте анықтауды, заманауи технологияларды, ұйымдастырушылық интеграцияны, кадрлық әлеуетті дамытуды және пациентке бағытталған қолдауды біріктіретін кешенді әрі тұрақты тәсіл қажет.
Түйінді сөздер: қатерлі ісік; ерте диагностика; скрининг; онкологиялық көмек; денсаулық сақтауды ұйымдастыру.

1. Introduction

Introduction. Currently, cancer has become one of the most pressing medical and social issues, posing a serious threat to public health worldwide. According to international cancer statistics cited by the authors, approximately 19.3 million new cases of malignant tumors are registered worldwide each year, and more than 10 million people die from cancer [1]. Its severe social and medical consequences make it a major priority in the field of public health, especially for low- and middle-income countries, where the problem is particularly acute [2]. In Colombia, in 2020, the cancer incidence rate was approximately 182 cases per 100,000 people. The most frequently reported types that year were prostate, breast, and colorectal cancers. The mortality rate for the same year was about 84.7 per 100,000 people [3]. In Canada, in 2022, approximately 28.2%

of all deaths were related to cancer. It was projected that in 2023, 239,100 new cancer cases would be diagnosed, and 86,700 people would die from the disease [4]. Moreover, it is estimated that one in two individuals will be diagnosed with cancer during their lifetime, and one in four will die from it [5].

In 2022, a total of 2,574,200 people died from cancer in China. Among them, 1,629,300 were men and 944,900 were women. The crude mortality rate was 182.3 per 100,000 population, while the age-standardized mortality rate (ASMR) reached 96.5 per 100,000. In urban areas, 1.4 million people died from cancer, compared to 1.17 million in rural regions. The deadliest type of cancer was lung cancer, accounting for 733,300 deaths. This was followed by liver cancer (316,500), stomach cancer (260,400), colorectal cancer (240,000), and esophageal cancer (187,500). These five types of cancer together accounted for 67.5% of all cancer-related deaths [6, 7].

In India, 916,827 people died from cancer in 2022. The crude mortality rate was 65.2 per 100,000, and the age-standardized mortality rate was 64.4 per 100,000. The most common types of cancer were oral, lung, breast, cervical, and stomach cancers. Among women, cervical cancer is of particular concern - over 70,000 women die from this disease each year [8].

In 2022, a total of 605,761 people died from cancer in the United States. The crude mortality rate was 180.9 per 100,000 population, while the age-standardized mortality rate was 82.3 per 100,000. Since 1991, the cancer mortality rate has decreased by 34%, thanks to early diagnosis and effective treatment. The most common types of cancer are lung, colorectal, breast, and prostate cancer. Among women, breast and lung cancers are the most prevalent, while prostate cancer is the most frequently diagnosed among men [9]. These figures highlight the need to consider cancer control as one of the top priorities of the healthcare system.

The objective of this review was to assess the current organization of oncology care relevant to urban populations, compare selected international models, and identify practical priorities for improving oncology care in Kazakhstan.

2. Materials and Methods

This work was structured as a narrative review. The review synthesized the 25 sources cited by the authors, including peer-reviewed studies, international cancer statistics, official national reports, methodological recommendations, and policy documents. The material was grouped into three analytical domains: the global and comparative cancer burden; international screening and service-organization models, with particular attention to Japan and South Korea; and the organization of oncology care in Kazakhstan. The synthesis focused on screening participation and effectiveness, early diagnosis, service accessibility, infrastructure, workforce and organizational measures. A formal systematic-search protocol, meta-analysis, and risk-of-bias assessment were not applied; therefore, the article should be interpreted as a structured narrative review rather than a systematic review.

3. Results

3.1. International experience in screening and early detection

Japan is one of the countries with the highest incidence of stomach cancer in the world. In 1983, a radiographic screening program (UGI) was introduced for individuals over the age of 40. Since 2016, endoscopic examination has been officially added as an alternative method and is particularly recommended for people over 50, with an interval of every 2–3 years [10]. Between 2017 and 2019, an average of 2.82 million people participated in radiographic screening annually. However, by 2021, this number had decreased to 2.16 million, a decline of 23.3% [11]. At the same time, the number of participants in endoscopic screening increased from 1.02 million to 1.15 million, representing a 13.1% rise. During the COVID-19 pandemic in 2020, radiographic screening dropped by 32.2%, while the number of endoscopic procedures decreased by only 9.0% [12]. According to a large-scale study, endoscopy reduced stomach cancer mortality by 61% (HR = 0.39), whereas radiography reduced it by 37% (HR = 0.63) [13]. The endoscopic method also lowered the prevalence of advanced-stage

cancer by 22%. The proportion of early-stage cancers detected through endoscopy exceeded 80%, while for radiography it was approximately 70%. As a result of these findings, Japan has achieved a high five-year survival rate exceeding 70%.

In South Korea, the national stomach cancer screening program was introduced in 1999. The program offers citizens aged 40 to 74 the opportunity to undergo free examinations using either endoscopy or radiography every two years [14]. In 2004, the screening participation rate was 39.2%, and by 2023, it had increased to 77.5% [15]. In 2022, 63.8% of the population underwent regular screening in accordance with the recommended schedule. Endoscopy is approximately twice as effective as radiography in the early detection of cancer (aOR = 2.10) [16]. Between 2005 and 2022, the proportion of stomach cancer cases detected at an early stage rose from 51.7% to 69.8%. The five-year relative survival rate, which was 43.9% in 1993–1995, reached 78.0% in 2016–2020 [17]. From 2018 to 2022, this rate was 72.9% [18]. The economic efficiency of endoscopic screening has also been proven: the cost of gaining one additional life-year is between 8.8 and 9.8 million won, while for radiography it exceeds 14.5 million won [19]. South Korea's experience is internationally recognized as a successful model for early cancer detection and mortality reduction.

3.2. Organization of oncology care in Kazakhstan

According to data from the National Research Institute of Oncology and Radiology of the Republic of Kazakhstan, as of January 1, 2017, there were 840 hospitals providing medical care to the population across the country (including 670 public and 170 private hospitals), as well as 2,718 outpatient and polyclinic facilities (1,856 public and 862 private) [2]. However, the quality of oncological care and its accessibility for the population still require improvement. The incidence of cancer is particularly high in the North Kazakhstan (337.8), Pavlodar (302.3), Kostanay (299.8), East Kazakhstan (297.5), and Karaganda (289.8) regions. The increase in these rates is partly associated with the introduction of screening programs and improvements in the quality of early diagnosis [20, 21].

Moreover, the mortality rate from oncological diseases is also concerning. In 2016, this rate across the republic was 88.79 per 100,000 population, compared to 92.0 in 2015. The highest mortality rates were recorded in Pavlodar (143.44), East Kazakhstan (130.73), North Kazakhstan (125.54), and Akmola (122.08) regions [21].

In Kazakhstan, national screening programs aimed at the prevention and early detection of malignant tumors are being actively implemented. Women aged 40 to 70 undergo mammography every two years for breast cancer prevention, women aged 30 to 70 receive cytological examinations every four years for the early detection of cervical cancer, and citizens aged 50 to 70 take a fecal occult blood test to detect colorectal cancer [22]. As a result of the screening, the rate of early-stage cancer detection has reached 32.7%, contributing to increased patient survival rates and improved treatment outcomes [23].

To improve the quality of oncological care, the "Roadmap for the Development of Oncological Care for 2018–2022" was approved [24]. The document provided for the development of oncology infrastructure and the equipping of oncology centers with modern technologies such as PET-CT, MRI, and radiotherapy devices. Additionally, retraining and advanced training programs are being conducted for oncologists, radiotherapists, and diagnostic specialists. To increase accessibility to oncological care in rural and remote areas, telemedicine, mobile screening units, and remote consultation systems are being introduced.

Kazakhstan collaborates with international organizations such as the World Health Organization (WHO), the International Atomic Energy Agency (IAEA), and the International Agency for Research on Cancer (IARC) in the field of oncology. Currently, the country is working on developing cancer registries and improving the accuracy of cancer data and the quality of monitoring in accordance with international standards [25].

Overall, the organization and improvement of oncology care is an important state priority aimed at reducing mortality from malignant tumors and increasing the lifespan and quality of life of patients.

4. Discussion

Oncological diseases today are one of the most important public health issues not only globally but also in Kazakhstan. To achieve successful results in the fight against cancer, a systematic and effective approach is necessary. International experience, especially the screening programs of Japan and South Korea, demonstrates the potential value of organized early detection and can serve as a reference point for Kazakhstan.

The screening programs being implemented in Kazakhstan, together with efforts to modernize medical infrastructure and digitalize oncology care, are concrete steps aimed at improving the quality of oncological services. At the same time, regional disparities, shortages of qualified personnel, and limited accessibility in remote areas remain relevant. For urban oncology services, these challenges are also important because the concentration of specialized care in cities increases the need for clear patient routing, multidisciplinary coordination, and continuity between primary and specialized care.

The reviewed evidence suggests that further improvement requires a comprehensive approach that combines modern technologies, adaptation of international standards, stronger early diagnosis and prevention, reliable cancer-registration systems, and psychosocial support aimed at improving patients' quality of life. International experience should not be transferred mechanically: differences in population structure, financing, screening organization, and available resources need to be considered when adapting these models to Kazakhstan.

Scientific novelty

The scientific novelty of the review lies in the comparative organizational synthesis of international screening models and the Kazakhstan oncology-care context, with a focus on practical priorities relevant to urban service delivery. The article does not claim generation of new clinical data; its contribution is the integration of evidence on screening, infrastructure, multidisciplinary care, cancer-data systems, and patient support into a unified organizational framework.

Practical significance

The synthesized findings may be used by healthcare managers and oncology-service administrators when planning screening pathways, diagnostic capacity, multidisciplinary patient routing, workforce development, digital tools, and psychosocial support in urban oncology care.

Limitations

The review has several limitations. The source selection was not based on a reproducible systematic-search protocol, and no formal assessment of study quality or risk of bias was performed. The included sources are heterogeneous in design, country, and publication year, and several Kazakhstan indicators refer to earlier reporting periods. In addition, not all cited international and national data are specific to urban populations. These factors limit direct comparison and should be considered when interpreting the conclusions.

5. Conclusion

Improving the organization of oncology care for urban populations requires a coordinated and long-term strategy. The experience reviewed in this article supports strengthening early detection and screening, modernizing diagnostic and treatment infrastructure, developing multidisciplinary care, improving data quality, and expanding psychosocial support. Adaptation of effective international approaches to Kazakhstan's national context can contribute to better accessibility, continuity, and quality of oncology care.

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DECLARATIONS / ДЕКЛАРАЦИИ / ДЕКЛАРАЦИЯЛАР

Ethics statement. This article is a structured narrative review of published literature and publicly available statistical and policy materials. It did not involve recruitment of participants, collection of identifiable personal data, or animal research; therefore, ethics committee approval and informed consent were not required.

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Author contributions. D.Zh. Kassenov - Conceptualization; Investigation; Data Curation; Writing - Original Draft. M.A. Kamaliev - Conceptualization; Methodology; Supervision; Validation; Writing - Review & Editing. N.A. Baltayev - Investigation; Resources; Validation; Writing - Review & Editing.

Этические аспекты. Статья представляет собой структурированный нарративный обзор опубликованной литературы, а также общедоступных статистических и нормативно-программных материалов. Набор участников, сбор идентифицируемых персональных данных и исследования на животных не проводились; в связи с этим одобрение этического комитета и информированное согласие не требовались.
Конфликт интересов. Авторы заявляют об отсутствии конфликта интересов.
Финансирование. Внешнее финансирование исследования отсутствовало.
Доступность данных. Все данные, рассматриваемые в статье, получены из опубликованных и общедоступных источников, приведенных в списке литературы.
Заявление о публикации. Авторы заявляют, что данная рукопись ранее не публиковалась и не находится на рассмотрении в другом издательстве.
Вклад авторов. Д.Ж. Касенов - разработка концепции; проведение исследования; курирование данных; подготовка первоначального варианта рукописи. М.А. Камалиев - разработка концепции; методология; научное руководство; валидация; рецензирование и редактирование рукописи. Н.А. Балтаев - проведение исследования; ресурсное обеспечение; валидация; рецензирование и редактирование рукописи.

Этикалық аспектілер. Мақала жарияланған әдебиеттерге, сондай-ақ жалпыға қолжетімді статистикалық және нормативтік-бағдарламалық материалдарға жасалған құрылымдалған нарративтік шолу болып табылады. Қатысушыларды зерттеуге тарту, сәйкестендірілетін дербес деректерді жинау және жануарларға зерттеу жүргізілген жоқ; осыған байланысты этикалық комитеттің мақұлдауы және ақпараттандырылған келісім талап етілмеді.
Мүдделер қақтығысы. Авторлар мүдделер қақтығысының жоқ екенін мәлімдейді.
Қаржыландыру. Зерттеуге сыртқы қаржыландыру берілген жоқ.
Деректердің қолжетімділігі. Мақалада қарастырылған барлық деректер әдебиеттер тізімінде көрсетілген жарияланған және жалпыға қолжетімді дереккөздерден алынған.
Жариялау туралы мәлімдеме. Авторлар бұл қолжазбаның бұрын жарияланбағанын және басқа баспада қарастырылып жатпағанын мәлімдейді.
Авторлардың үлесі. Д.Ж. Касенов - тұжырымдаманы әзірлеу; зерттеу жүргізу; деректерді курациялау; қолжазбаның бастапқы нұсқасын дайындау. М.А. Камалиев - тұжырымдаманы әзірлеу; әдіснама; ғылыми жетекшілік; валидация; қолжазбаны рецензиялау және редакциялау. Н.А. Балтаев - зерттеу жүргізу; ресурстармен қамтамасыз ету; валидация; қолжазбаны рецензиялау және редакциялау.

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