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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებშიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи.** Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html. В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საყურადღებო!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე, დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემავსებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიის ფოტოსურათები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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EPIDEMIOLOGY AND DIAGNOSTIC CHALLENGES OF AUTISM SPECTRUM DISORDERS IN CHILDREN IN THE REPUBLIC OF KAZAKHSTAN

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Abstract.

Objective of the study: To assess the prevalence of autism spectrum disorders (ASD) among children in Kazakhstan, the availability of psychiatric and correctional care, and to identify barriers to diagnosis and treatment.

Materials and methods: The data from the statistical collection “Psychiatric Care to the Population of the Republic of Kazakhstan” (2015–2023) and the results of an online survey of 188 parents of children with ASD, conducted in 2021 through public organizations in 29 cities/towns, were analyzed. Descriptive statistics, chi-square test, Mann-Whitney test, and logistic regression were used.

Results: In 2023, the number of psychiatrists was 0.4 per 10,000 population, psychotherapists - 0.01. The contingent of children with ASD increased from 8.6 (2015) to 161.3 per 100 thousand children aged 0-17 years (2023), primary incidence - from 4.3 to 33.6 per 100 thousand (2015-2022). The survey revealed that 81.4% of children receive correction, but ABA therapy is available to only 4.3% of them. The average age of diagnosis is 2.5 years, and 79.8% of parents have low awareness—the main barriers are a shortage of specialists, high cost of services, and stigmatization.

Conclusions: Low detection rates of ASD (compared to the US - 3220 per 100,000, South Korea - 2640) are due to a lack of screening, shortage of specialists, and low awareness. The study highlights the unique challenges of Central Asia, where a lack of data and resources hinders diagnosis and support. A national program of screening, training of specialists, and subsidizing of ABA therapy is needed. The work holds international importance for countries with transition economies, particularly in Central Asia, where similar problems necessitate systemic solutions.

Key words. Autism spectrum disorders, Kazakhstan, prevalence, psychiatric care, barriers, inclusion.

Introduction.

Autism spectrum disorders (ASD) are neurodevelopmental disorders characterized by difficulties in social communication, repetitive behaviors, and restricted interests. The global prevalence of ASD, according to the World Health Organization (WHO), is 1–2%, but rates vary depending on the diagnostic capabilities of the region [1]. Countries with different levels of economic development and health systems were selected for comparison to show the contrast in ASD detection: the USA and South Korea (developed economies with systemic screening), Australia and Canada (similar health systems), the UK (high awareness), and Iran, Colombia and India (countries

with transitional economies, like Kazakhstan, with limited resources). Table 1 presents data on the prevalence of ASD in these countries.

The choice of countries is determined by their economic and medical characteristics: developed countries (USA, South Korea, Australia, Canada, UK) demonstrate high detection rates due to systematic screening and access to specialists, while countries with transitional economies (Iran, India, Colombia) and low-resource countries (Nigeria) have problems similar to Kazakhstan - a shortage of specialists and low awareness. The increase in the number of ASD cases in the world is associated with improved diagnostics. Still, the hypothesis of an increase in the incidence requires clarification [2]. Possible factors include environmental (exposure to pollutants, nutrition), social (changing family structures, late age of parents), and genetic (de novo mutations, epigenetic changes). However, evidence remains limited and requires further research [2-4].

Kazakhstan, a country in Central Asia with a population of 19.8 million [5], faces challenges in the diagnosis and treatment of ASD due to limited resources, uneven distribution of health services, and low public awareness. In 2023, 8941 children with ASD were registered (161.3 per 100 thousand children aged 0–17 years) [6], but expert estimates point to 59 thousand cases [7], which highlights the problem of underdiagnosis. The study used the ICD-10 criteria (F84.0 - childhood autism, F84.1 - atypical autism, F84.5 - Asperger syndrome), as they are the standard in medical practice in Kazakhstan. Modern classifications, such as DSM-5 and ICD-11, were not used due to their limited implementation in the national healthcare system and the lack of adapted tools for screening and diagnosis, which is one of the barriers to an accurate prevalence assessment.

Objective of the study: To assess the prevalence of ASD among children, the availability of psychological, pedagogical, psychiatric, and correctional assistance, and to identify barriers to diagnosis and treatment in Kazakhstan. The work is based on statistical data for 2015–2023 and a survey of 188 parents.

Research objectives.

- To assess the dynamics of accessibility of assistance for 2015–2023.
- To analyze the prevalence and primary incidence of ASD.
- To study the diagnostic and treatment status of children with ASD based on a survey of parents.
- Compare the situation in Kazakhstan with that of other countries and provide recommendations.

This study is one of the first attempts in Kazakhstan to provide a clinical and epidemiological cross-section of ASD issues,

contributing to the study of autism in Central Asia, where systematic data are virtually absent.

Materials and Methods.

Study design:

An exploratory and descriptive design combining statistical analysis and an online survey of parents of children with ASD.

Data sources.

Official statistics: Collection “Psychiatric care for the population of the Republic of Kazakhstan for 2015–2023” [6]. The following indicators were analyzed:

1. The number of psychiatrists and psychotherapists (absolute numbers and per 10 thousand population) for 2015–2023.
2. The incidence of children aged 0–17 years with ASD per 100,000 population aged 0–17 years (atypical autism [F84.1], Asperger syndrome [F84.5], childhood autism [F84.0]).
3. Primary incidence of childhood and atypical autism per 100 thousand population aged 0–17 years.

Parent survey: Conducted from June to October 2021 among 188 parents through 5 public organizations dealing with autism in 29 cities/towns of Kazakhstan. The survey was administered via public ASD-related organizations, potentially biasing the sample towards a relatively informed group already linked to support networks. Written consent was obtained. The questionnaire included questions on diagnosis, age of diagnosis, correction, barriers, and place of residence. Reliability was assessed by Cronbach's alpha coefficient ($\alpha = 0.72$).

Verification of diagnoses: All interviewed parents provided conclusions from child psychiatrists confirming the diagnoses of ASD (F84.0, F84.1, F84.5 according to ICD-10), which ensured the reliability of the data.

Ethical aspects.

The study was approved by the Local Ethics Committee of Al-Farabi Kazakh National University (protocol No. IRB–A086, dated April 16, 2020). All respondents were informed about the study's objectives, the voluntary nature of their participation, and their right to refuse without consequences. Written informed consent was obtained from each participant. Confidentiality was ensured by anonymizing the data: personal information (name, address) was replaced with unique identifiers, and the data were stored on a secure server with access only to the researchers. In cases of refusal ($n=12$), the data were excluded from the analysis, and potential participants were provided with information about available support resources.

Inclusion and exclusion criteria:

Turning on:

- Children aged 3 months – 18 years with a verified diagnosis of ASD (F84 according to ICD-10).

Exception:

- Parental refusal.
- Lack of legal representatives.

Methods of analysis.

- **Descriptive statistics:** Absolute and relative indicators, time series.
- **Statistical tests:**

- o Cronbach's alpha for questionnaire reliability.
- o Chi-square test for the association between place of residence and access to correction.
- o Mann-Whitney for cost comparison (urban/rural).
- o Logistic regression for factors of access to correction.

Software: Python (pandas, scipy, statsmodels). Significance level: $p < 0.05$.

Results.

Availability of specialists and comparison with other countries:

In 2023, Kazakhstan had 4 psychiatrists per 100,000 population (704 specialists) and 0.1 psychotherapists per 100,000 (19 specialists). [6] Since 2015 (0.5 psychiatrists and 0.03 psychotherapists per 10 thousand), there has been a decrease in the availability of specialists. A comparison with other countries is presented in the Introduction section (Table 1).

Table 1. Prevalence of Autism Spectrum Disorder (ASD) and Availability of Mental Health Professionals by Country (2023).

Country	ASD Prevalence (per 100,000)	Psychiatrists (per 100 ,000)	Sources
Kazakhstan	161.3	4	[6]
USA	3,220	12.4	[2,13]
South Korea	2,640	13.4	[3,13]
Iran	600	1.9	[11,13]
India	1,000	0.3	[14,13]
Australia	1,700	14.8	[8,13]
United Kingdom	1,000	18.0	[10,13]
Canada	2,000	13.0	[9,16]
Colombia	187	2.7	[12,13]
Nigeria	930	0.3	[15,13]

Note: Data sourced from WHO Mental Health Atlas 2020 [13], national health statistics [6,9,10,16], and peer-reviewed studies [2,3,8,11,12,14,15].

Prevalence of ASD:

The number of children with ASD increased from 861 (8.6 per 100,000 children aged 0–17) in 2015 to 8941 (161.3 per 100,000) in 2023 [6]. By category: atypical autism (F84.1) increased from 4.5 to 79.8 per 100,000, childhood autism (F84.0) — from 3.4 to 79.8, Asperger syndrome (F84.5) — from 0.7 to 1.7 per 100,000. The dynamics are presented in Figure 1.

Primary morbidity:

New cases of ASD increased from 4.3 (2015) to 33.6 per 100,000 (2022) [6]. Childhood autism rose from 2.6 to 22.1, and atypical autism increased from 1.7 to 11.5 per 100,000. Figure 2 illustrates the dynamics of primary morbidity.

Parents' survey.

A survey of 188 parents found:

Distribution of respondents: Out of 188 respondents, 165 (87.8%) live in cities (e.g., Almaty, Astana, Aktobe, etc.), and 23 (12.2%) live in villages. Among children, 130 (69.1%) are boys, and 58 (30.9%) are girls. The diagnoses were distributed as follows: F84.0 Childhood autism - 88 (46.8%), F84.1

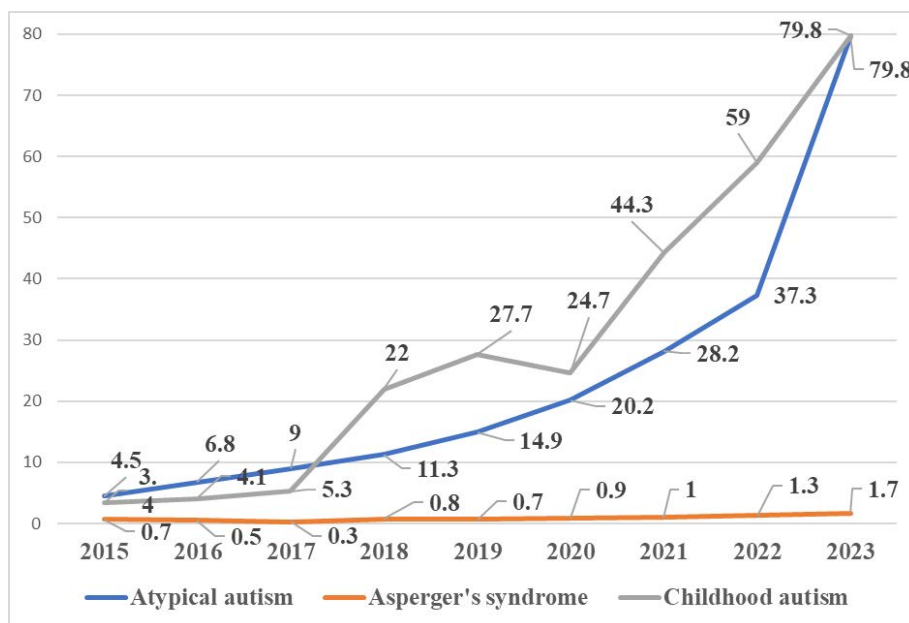


Figure 1. Prevalence of Autism Spectrum Disorders in Children Aged 0–17 (2015–2023): Rates per 100,000 Population.

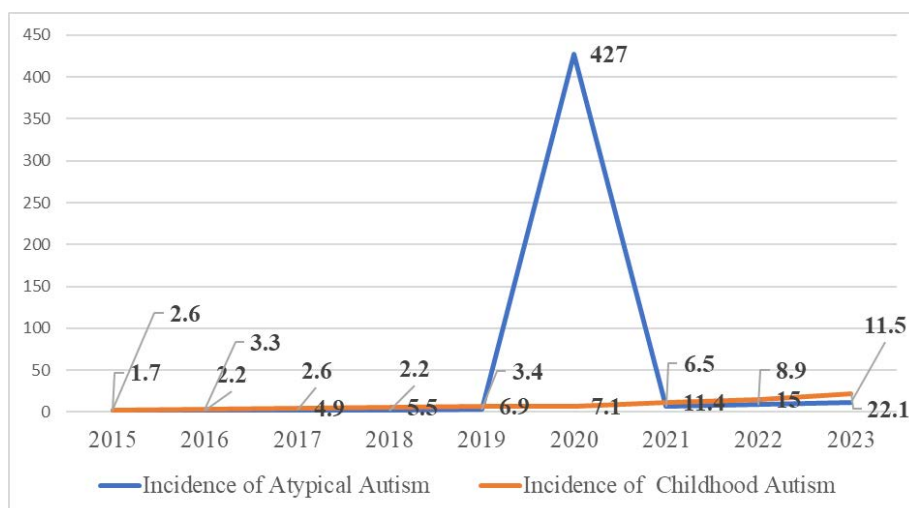


Figure 2. Incidence of Atypical and Childhood Autism per 100,000 Children (0–17 Years), 2015–2023.

Atypical autism - 83 (44.1%), F84.5 Asperger's syndrome - 3 (1.6%), F84.8 Other pervasive developmental disorders - 14 (7.5%). [24] 146 (77.7 %) children have disability status. The average age of diagnosis was 2.5 years, calculated from exact ages reported by parents, grouped into categories (0–4 years: [48,9%], 5–11 years: [51,1%]) for brevity. Parents' knowledge of autism at the time of diagnosis: 5.3% knew a lot, 14.9% knew something from the Internet, 79.8% knew nothing. (Table 2).

Correctional assistance: The majority of children (81.4%, or 153 people) receive corrective assistance, while 18.6% (35 people) do not. Children often undergo multiple types of therapy and correction simultaneously. The most common forms are corrective pedagogy (46.3%) and the development of social communications (44.7%). Medication (30.9%), ABA therapy (4.7%), and occupational therapy (1.2%) are also used; however, the latter two are less common due to a shortage of specialized specialists (Table 3).

Correction costs: The average annual cost was \$ 642.78 USD (median: \$ 421.05 USD, range: \$ 25.26–\$6,315.79 USD). For context, the monthly average wage in Kazakhstan in 2023 was approximately 300 USD, which, adjusted for costs, represents a significant burden (about 20% of annual family income). According to the Mann-Whitney test, the median costs in villages (526.32 USD) are higher than in cities (421.05 USD) ($U = 1542$, $p = 0.038$), due to the need to travel to cities. 52.1% of parents (98 out of 188) took out loans for treatment.

Inclusion: 16.5% of children (31 out of 188) attend mainstream schools, and 24.4% (46) are home-schooled. Satisfaction with the quality of home-schooling (50%, 23 out of 46 parents) was measured using a 5-point Likert scale (1 = extremely dissatisfied, 5 = completely satisfied; satisfied = 4–5). The lack of standardized scales, such as the Satisfaction with Educational Services Scale, limits the accuracy of the assessment. There are 504 special education organizations in Kazakhstan, 70%

Table 2. Respondent characteristics, age of diagnosis, and parents' awareness of ASD.

Indicator	Percent (%)	Number of respondents
Children with a confirmed diagnosis of ASD	100%	188
Diagnosed at 0–4 years	48.9%	92
Diagnosed at 5–11 years of age	51.1%	96
Children receiving correction	81.4%	153
Children without treatment	18.6%	35
Attend comprehensive schools	16.5 %	31
Homeschooled	24.4 %	46
Satisfied with homeschooling	51.9%	27
Little information about autism at diagnosis	79.8%	150
We were looking for a private doctor	56.4%	106

Table 3. Types of correction received by children with ASD.

No.	Type of correction	Quantity	Percent (%)
1	Correctional pedagogy	87	46.3
2	Social communication	84	44.7
3	Defectologist	63	33.5
4	Drug treatment	58	30.9
5	Inclusive education	34	18.1
6	Cognitive psychotherapy	25	13.3
7	Special diet	24	12.8
8	Occupational therapy	12	6.4
9	ABA therapy	8	4.7
10	Other (Speech therapist, psychologist, etc.)	22	11.7
11	Not receiving correction	35	18.6

Table 4. Binary logistic regression results for receiving correctional assistance.

Predictor	OR	95% CI	p-value
Place of residence (city)	2.76	1.08–7.04	0.034
Parental awareness	0.58	0.37–0.91	0.018
Financial position	0.87	0.65–1.16	0.285
Age of diagnosis	0.92	0.81–1.05	0.392
Disability status	3.12	1.22–7.98	0.017

of which are located in cities and 30% in regional centers [8]. The effectiveness of these organizations varies: in cities, access to resources is higher, but in rural areas, there is a shortage of qualified specialists and equipment.

Statistical analysis: The chi-square test revealed an association between place of residence and access to correction ($\chi^2 = 4.92$, $p = 0.027$): 83.6% in cities (138/165) versus 65.2% in villages (15/23). Costs in villages (250,000 tenge) are higher than in cities (200,000 tenge) ($U = 1542$, $p = 0.038$). Logistic regression (pseudo- $R^2 = 0.23$) revealed that urban residence and disability status increased the likelihood of receiving correction, while high parental awareness decreased it (Table 4).

• **Units of measurement:** regression coefficients (OR), confidence intervals (95% CI), p-values.

• **Description:** The table contains regression coefficients,

confidence intervals, and statistical significance for factors influencing access to correction.

Discussion.

Prevalence and Detectability:

The prevalence of autism spectrum disorders (ASD) in Kazakhstan increased from 8.6 (2015) to 161.3 per 100 thousand children aged 0–17 years (2023) [6], but remains lower than in developed countries: the USA (3,220 per 100 thousand) [2], South Korea (2,640) [3], Australia (1700) [8], Canada (2000) [9], and the United Kingdom (1000) [10]. The rate is comparable to that of Iran (600) [11], Colombia (187) [12], and Nigeria (930) [15]. Differences in detection are due to health care systems and cultural factors. In the United States and South Korea, systematic screening (e.g., M-CHAT in the United States, national programs in South Korea) and a high level of specialist training ensure early diagnosis. In Iran and Colombia, as in Kazakhstan, a shortage of specialists (0.5 and 0.4 psychiatrists per 10,000, respectively) and cultural stigma hinder help-seeking. In Kazakhstan, low detection is due to the lack of national screening, a shortage of specialists (0.4 psychiatrists per 10,000), and low awareness (79.8% of parents did not know about ASD). The expert estimate of 59,000 children with ASD is based on calculations by public organizations (e.g., the Asyl Miras Foundation) using global WHO indicators (1–2%) and demographic data for Kazakhstan (19.8 million people, including 5.5 million children aged 0–17). This suggests significant underdiagnosis, particularly in rural areas where access to specialists is limited.

Availability of specialists:

The number of psychiatrists in Kazakhstan (4.0 per 100,000 in 2023) [6] is comparable to that in Iran (1.9) [11] and Colombia (2.7) [12], but lower than in South Korea (13.4) [3], Australia (14.8) [8], Canada (13.0) [16], and the United Kingdom (18.0) [10]. WHO recommends 30 psychiatrists per 100,000 population [1], which in Kazakhstan requires an increase in the number of specialists from 704 to 5,940. There are practically no psychotherapists (0.01 per 10,000), which limits access to ABA therapy, which is effective in developed countries [16]. In Iran, cultural barriers such as stigma reduce the number of people seeking help, while in South Korea, state training programs for specialists increase the availability of care.

Access to correctional assistance:

Access to correction in Kazakhstan (81.4%) is higher than in Iran (<20%) [18], but lower than in developed countries (50–70%) [3,9]. Living in the city, having a disability, and high parental awareness decreased the likelihood of correction (Table 4). However, access to ABA therapy is limited (4.7%) due to a shortage of specialists and high costs (average costs are \$ 642.78 USD, approximately 20% of the annual family income, given an average salary of \$ 300 USD per month) [5]. In South Korea, subsidies for therapy increase accessibility, unlike in Kazakhstan, where private services are more prevalent. [20]

Limitations and ways to overcome them:

The survey sample, comprising 188 parents (87.8% urban), is not representative of rural areas, which limits its

generalizability. Using ICD-10 instead of DSM-5 or ICD-11 excludes consideration of genetic and autism-like disorders. Future studies are recommended to increase the sample size, including more rural respondents, through collaboration with regional health institutions; introduce standardized diagnostic tools (e.g., ADOS); and use ICD-11 or DSM-5 to account for modern classifications. The lack of data on the effectiveness of interventions requires longitudinal studies.

Recommendations.

- Screening: Implement a national program using adapted tools such as M-CHAT-R/F [19], which has been successfully used in South Korea [20]. Pilot programs could be launched in Almaty and Astana with subsequent scaling.

- Training of specialists: Expand the residency in child psychiatry to include modules on ABA therapy. Existing programs at the Kazakh National Medical University could be supplemented with international courses (e.g., BCBA certification).

- Subsidies for ABA therapy: Develop government grants for families, as in Canada [21], that cover up to 50% of therapy costs.

- Mobile services: Create mobile diagnostic and correction teams for rural areas, following the Iranian model [11].

- Awareness raising: Launch campaigns through the media and schools, integrating the UK experience [22], with a focus on reducing stigma.

Conclusion.

The study revealed an increase in the number of children with ASD registered in Kazakhstan from 8.6 to 161.3 per 100,000 children aged 0–17 years for 2015–2023, but detection remains low due to a shortage of specialists (0.4 psychiatrists per 10,000 population), lack of systemic screening, weak coordination of agencies, and insufficient infrastructure. Compared with developed countries such as the United States [2] and South Korea [3], the prevalence of ASD in Kazakhstan is lower, which is associated with diagnostic problems, including limited use of methodologies for differential diagnosis of autism and autism-like disorders. Access to correction (81.4%) is limited in rural areas and for ABA therapy (4.7%), and costs (642.78 USD) account for a significant share of family income (average salary is 300 USD/month).

There is only one conclusion - a national program is needed that includes a set of measures to support children with ASD - this is early diagnosis, expansion of neonatal screening, expansion of methodological approaches for differential diagnosis of autistic and autistic-like disorders, guaranteed access to correction (therapy), guaranteed educational process with the creation of resource classes and support of tutors, a solution to the issue of further residence upon transition to adulthood, covering all places of residence - city, village.

This study contributes to the study of ASD in Central Asia, where systematic data are virtually nonexistent. The results can be used to develop national screening and support programs for children with ASD, as well as to raise public awareness, which is especially important in resource-poor and highly stigmatized settings.

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