**ABSTRACT**
**of the dissertation work by Kimatova Kerbez Naushaevna titled:**
**"Medical and social needs of the older people based on the EASYCare Standard 2010 questionnaire in the Republic of Kazakhstan",**
**submitted for the degree of Doctor of Philosophy (PhD) under the educational program 8D10101 – Public Health**.


**Background**

According to the World Health Organization (WHO), the global population aged 65 and older is expected to more than double—from 761 million in 2021 to 1.6 billion by 2050. The number of people aged 80 and over is projected to grow even faster. While in 1950 only 1 in 20 people in the world were aged 65 or older, in 2021 it was 1 in 10, and by 2050 this age group will account for 1 in 7 people (UN, 2023). Gradual and steady population aging has become one of the most pressing demographic transformations of the 21st century. This process affects nearly every country in the world—both developed and developing—and has a profound impact on health systems, the economy, and the social sphere (WHO, 2020). Population aging worldwide gives rise to a number of key challenges, including:

*Rising life expectancy:* Thanks to advancements in nutrition, sanitation, healthcare, and disease prevention, the global average life expectancy increased from 46 years in 1950 to 73 years in 2020. It is expected to exceed 80 years in at least 91 countries by 2050 (Jamison et al., 2013; Bloom, 2020).

*Transformation of age structure*: Due to declining birth and death rates, demographic pyramids are flattening. Older cohorts are growing faster than younger ones, leading to increased old-age dependency ratios. These changes are most pronounced in developed countries, but are now rapidly occurring in developing regions as well. By 2050, the fastest growth in the number of older people is expected in Sub-Saharan Africa, Northern Africa, and Western Asia (UN, 2023).

*Epidemiological transition:* Aging is accompanied by a shift toward noncommunicable chronic diseases (NCDs) (McKeown, 2009). Older adults are more likely to experience cardiovascular diseases, diabetes, osteoarthritis, dementia, and cancer (Jones & Dolsten, 2024). This growing burden necessitates a reorganization of health systems to prioritize long-term care, chronic disease management, and integrated services (McKeown, 2009). Additionally, mental health issues such as depression and cognitive decline are prevalent among the elderly and require specialized support (Yon et al.,2017)

*Decline in functional status and care dependency:* The concept of "healthy aging" emphasizes the maintenance of functional ability throughout the life course. Nevertheless, many older individuals face deteriorating physical and cognitive function, leading to increased dependency. Limitations such as difficulty walking, dressing, or cooking are strong predictors of institutionalization and rising healthcare costs (Falck et al., 2022). Creating environments that support mobility, safety, and social participation is essential for preserving independence (Rantanen, 2013). Age-friendly communities, accessible public spaces, and support for informal caregivers are key conditions for functional aging (Ferris& Johnson, 2015).

*Gender and social inequities:* Aging impacts men and women differently. Women generally live longer, but are more likely to experience higher levels of morbidity and

economic insecurity in old age due to wage gaps and unequal caregiving responsibilities (Grépin, Poirier & Fox, 2020; Chan et al.,2023). Rural populations and vulnerable groups also face barriers to healthcare and social protection. Policies must address these disparities by ensuring universal health coverage, adequate pensions, and culturally competent care (Report of the Committee on Ways and Means Majority U.S. House of Representatives, 2020).

*Staff shortages and skill deficits:* As the population ages, demand for healthcare services increases, while at the same time, there is a shortage of healthcare workers. Challenges include the aging of the healthcare workforce itself, insufficient training in geriatrics, and the lack of long-term care and rehabilitation services (WHO, 2016). Investment in educational programs, interprofessional care models, and workforce retention strategies is essential. Expanding the roles of nurses and social workers can help bridge service gaps.

*Healthcare financing and long-term care:* Public expenditures on healthcare and pension provision are expected to increase significantly. In G20 countries, population aging may lead to an increase in spending by 6–7% of GDP by 2050 if current policies remain unchanged (OECD, 2024). Despite their importance, long-term care systems remain underfunded. A shift toward personalized, community-based care models can improve outcomes and reduce costs. Financing should incentivize preventive care and support for informal caregivers (OECD, 2022).

*Infrastructure and service delivery:* Older adults require age-friendly healthcare services, including home-based care, telemedicine, and accessible transportation (Ferris& Johnson, 2015). However, many health systems are not prepared to deliver such services at scale. It is critical to develop integrated care models that combine medical and social support (OECD, 2024). Information systems should track not only clinical data but also functional status and social determinants of health.

*Economic impacts of aging:* The consequences of population aging are multifaceted. A shrinking working-age population slows economic growth, while increased pressure on social protection systems leads to overload. In developed countries, per capita GDP growth is projected to decline by 0.4% annually due to aging (International monetary fund, 2020) Nevertheless, older people contribute to the economy through paid work, caregiving, volunteering, and consumption. Prolonging workforce participation and promoting lifelong learning can mitigate losses (OECD, 2019). Other adaptation mechanisms include migration, automation, and increased female labor force participation. Pension and tax reforms must be both sustainable and equitable.

In the Republic of Kazakhstan, a similar demographic trend of population aging is observed, accompanied by an increase in the number of older adults, necessitating a reassessment of existing healthcare and social support models. According to predictive population pyramids for Kazakhstan from 1950, 2020, and 2050, there is a clear trend toward aging (ESCAP, 2023). A significant increase in the proportion of elderly people, especially those aged 65 and older, is expected, indicating the need for strategic adaptation of the healthcare and social support systems with a focus on the needs of the aging population (UNFPA, Kazakhstan, 2021).

A practical and adequate response to this demographic shift requires accurate, personalized assessment of older adults' needs, which can help prevent the deterioration of

their independence (Tobis et al., 2018). All of this highlights the importance of a multidisciplinary approach and has led to the development of tools for comprehensive assessment of medical and social needs. One such tool is the EASYCare Standard 2010 (ECQ) questionnaire. Over the past two decades, it has become available in the languages of all WHO regions and has been used to assess and identify the unmet needs of older people (Philip et al., 2014). The ECQ system functions as a comprehensive tool for older individuals, addressing specific issues and priorities related to their needs, health, and overall well-being (Jotheeswaran et al., 2016 & Craig et al.,2015 ). This instrument offers a simple and practical approach to evaluating various aspects such as activities of daily living (ADL), instrumental activities of daily living (IADL), mental health, social interaction, and well-being.

In Kazakhstan, data on the needs of the elderly population are only partially available and limited to certain aspects of care and palliative services (Abdina & Uyzbayeva, 2024; Zhylkybekova et al., 2023). Therefore, further research is needed to gain a comprehensive understanding of the current circumstances and demands, as well as to identify areas requiring additional support. Consequently, we applied an interdisciplinary approach using the EASYCare Standard 2010 tool in analyzing the needs of older adults, which is a key factor in laying the groundwork for planning sustainable elderly care in the future Kazakhstani society.

**Aim of the research:**

To identify and analyze the medical and social needs of elderly people in the Republic of Kazakhstan using the standardized questionnaire EASYCare Standard 2010, taking into account their physical, psychosocial and functional state.

**Research objectives:**

1. To adapt and validate the EASYCare Standard 2010 questionnaire in Kazakh and Russian to ensure its applicability within the context of the Republic of Kazakhstan.
2. To identify the medical and social needs of the elderly through a standardized assessment of their physical, psychosocial, and functional status.
3. To identify and analyze the determinants influencing the medical and social needs of older adults.
4. To develop evidence-based recommendations for enhancing the system of medical and social monitoring and support for the elderly, based on the findings of the study.

**Scientific novelty**

For the first time in Kazakhstan:

• The first assessment of medical and social needs of elderly people in Kazakhstan using the EASYCare Standard 2010 questionnaire. Until now, this tool has been used mainly in Europe, the USA, the Middle East (Iran, Turkey) and India, but has not been used in the Republic of Kazakhstan.

• For the first time, the linguistic and cultural adaptation of the questionnaire into Kazakh and Russian was carried out, which allows it to be used in local conditions to identify the needs of elderly people.

• A comprehensive analysis of the factors influencing the medical and social needs of elderly people in Kazakhstan. The use of statistical and multivariate analysis allowed us to identify key determinants that determine the level of medical and social needs, including education, financial status and other socio-demographic characteristics.

• For the first time in Kazakhstan, the correlation of EASYCare indices with the Barthel index and Lawton scale was used, which made it possible to assess the independence of elderly people and their predisposition to hospitalization and falls.

**Theoretical significance of the study:**

• This study is the first to introduce and validate the EASYCare Standard 2010 tool in Kazakhstan, thereby expanding the theoretical foundations of comprehensive geriatric assessment (CGA) in local healthcare and academic settings.

• The identification of key influencing factors—such as education, financial status, and region of residence—provides a theoretical basis for understanding inequality in aging and health vulnerability among older adults in Kazakhstan.

• The study supports WHO's concept of functional ability and independence in later life, offering empirical evidence that such indicators are measurable and relevant for local aging policy and clinical practice.

• The findings support the theoretical integration of public health, geriatrics, and social policy, enabling a more evidence-based and interdisciplinary approach to aging research and system design in Kazakhstan.

**Practical significance**

• The adaptation and validation of the EASYCare Standard 2010 questionnaire into Kazakh and Russian languages has produced a reliable instrument for use in clinical settings, enabling healthcare providers to assess the needs of older adults.

• The study provides a basis for incorporating standardized geriatric assessments into routine primary care and nursing practice, especially in outpatient clinics and home-based services.

• By generating three specific indices—Independence score, Risk of falls, and Risk of breakdown in care—the tool allows practitioners to identify older adults at risk and develop personalized care plans and preventive strategies.

• The research results offer scientifically grounded data to support policy recommendations aimed at strengthening geriatric care, long-term support systems, and the allocation of resources for aging populations in Kazakhstan.

• The findings of the study were used to develop methodological recommendations aimed at maintaining the independence of older adults, improving their quality of life, and enhancing their physical, psycho-emotional, and social well-being. These recommendations have been implemented in the work of three urban polyclinics in the city of Aktobe. Additionally, a master class for nurses was conducted under the title: "Patients at high risk of falls — A challenge in geriatric care."

• The methodological recommendations derived from this study were integrated into the academic curriculum for students enrolled in the "Nursing" educational program. Specifically, they were incorporated into the course "Nursing Care in Gerontology" and the professional practice module "Gerontological Nursing", thereby contributing to the professional development of future healthcare providers.

**Key provisions submitted for defense**

• Adaptation and validation of the EASYCare Standard 2010 questionnaire into Kazakh and Russian languages made it possible to introduce an international tool for assessing the medical and social needs of older people for the first time in Kazakhstan, which ensures its reliability and applicability in local conditions.

• Key medical and social needs of older people in Kazakhstan were identified based on a standardized survey, including the risks of functional dependence, falls, breakdown in care, as well as insufficient social support and financial constraints.

• The main factors influencing the medical and social needs of the elderly have been identified, among which the level of education, age, marital status and financial situation play a key role.

• The research results can be used to adjust existing geriatric care programs and make additions to the national health policy, which will improve the availability and quality of medical and social support for the elderly in Kazakhstan.

**Aprobation of the work**

The main provisions of the dissertation were presented and discussed at the following conferences:

• International scientific conference of students and young scientists “Farabi Alemi.” Presentation: “Development of an algorithm for providing assistance to elderly people based on the determination of medical and social needs in Aktobe. Research protocol”, April 6–8, 2021, Almaty. Awarded 2nd place.

• X annual international scientific and practical conference “Topical issues of medicine”. Presentation: “Validation of the EASYCare Standard 2010 instrument to identify the functioning and well-being of elderly people in Aktobe, Kazakhstan”, April 27–28, 2023, Baku, Azerbaijan. Awarded 1st place in the category “Best research work among young scientists”.

**Publications related to the dissertation:**

As part of this dissertation research, five publications were produced, including one article in the international peer-reviewed scientific journal *Frontiers in Public Health*, indexed in the Web of Science (Impact Factor 3.0; Q2) and Scopus (CiteScore 4.8; 70th percentile); two publications in journals included in the second list recommended by the Committee for Control in the Sphere of Education and Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan; and two abstracts published in the proceedings of international scientific conferences.

**Compliance with scientific development priorities or state programs**

The dissertation research was conducted within the framework of the scientific and technical project “Improving geriatric and gerontological care in the Republic of Kazakhstan” and was funded by the Ministry of Education and Science of the Republic of Kazakhstan (AP09562783).

The dissertation corresponds to the priority direction of science development approved by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan, namely the direction of «The science of life and health».

**Implementation of study findings in clinical practice:**

The results of the conducted research were introduced into practical healthcare settings at the following institutions:

• State Municipal Enterprise "City Polyclinic №1" under the Health Department of Aktobe Region.

• State Municipal Enterprise "City Polyclinic №4" under the Health Department of Aktobe Region.

• State Municipal Enterprise "Family Medicine Clinic" of NJSC West Kazakhstan Marat Ospanov Medical University

**Implementation in educational and methodological work:**

The methodological guideline titled “Maintaining the independence of older adults” approved by the Academic Council of West Kazakhstan M. Ospanov medical university on February 27, 2025, protocol №6 (823), was integrated into the educational process as supplementary materials for the course “Nursing Care in Gerontology” and the professional practice “Nursing in Gerontology”, within the educational program 6B10103 “Nursing” based on technical and vocational education.

**The author's personal contribution** includes the organization and implementation of pilot studies for the validation of the Russian and Kazakh versions of the EASYCare Standard 2010 questionnaire, the development and execution of the main research program, coordination and partial administration of the survey in four regions of Kazakhstan, statistical processing and analysis of the obtained data, interpretation of the results and discussion of the key findings, independent preparation of all sections of the dissertation, implementation of the research results in practical healthcare, development and approval of methodological guidelines, as well as participation in the writing and preparation of scientific publications, including formulation of objectives, result analysis, and manuscript editing.

**Volume and structure of the dissertation.**

The dissertation consists of an introduction, literature review, description of materials and methods, results of the original research, discussion and a conclusion that includes findings and practical recommendations, a list of references, and appendices.

The list of references includes 174 sources. The total volume of the dissertation is 137 pages and contains 17 figures and 19 tables.

**Materials and methods**

This study was approved by the Local Bioethics Committee of the Marat Ospanov West Kazakhstan Medical University, Aktobe, on October 14, 2020 (Protocol №8).

**Study design:** Cross sectional study.

**Object of the study**: Older adults aged 65 and over residing in the cities of Aktobe, Uralsk, Shymkent, and Kyzylorda.

**Subject of the research:** medical and social needs of the old people.

**Inclusion Criteria:** Individuals aged 65 and older individuals with full verbal communication abilities and no cognitive impairment.

**Exclusion criteria** included individuals younger than 65 years of age and those with cognitive impairment.

**Calculation of sample size**

To ensure methodological rigor and statistical validity, the required sample size for the planned regression analysis was determined through a priori power calculation using G*Power version 3.1, a recognized tool for statistical power estimation in behavioral and health sciences. The analysis was conducted for a fixed-effects linear regression model, assuming five independent variables and an anticipated effect size ($f^2$) of 0.176, which corresponds to a minimum expected proportion of explained variance ($R^2 \approx 0.15$). This estimate was informed by prior studies examining similar constructs in geriatric populations.

The significance level (α) was set at 0.05, and statistical power (1 − β) at 0.80, in accordance with conventional thresholds in epidemiological research to limit the probability of Type I and Type II errors, respectively. Under these parameters, the minimum required sample size was calculated to be 92 participants. However, anticipating real-world challenges in field-based data collection—including potential non-response, incomplete questionnaires, and participant attrition—a 20% inflation factor was applied, yielding an adjusted sample size of 111 participants.

Nevertheless, given the complexity of the research objectives, including subgroup analyses and regional comparisons, a substantially larger sample was sought to enhance generalizability and precision. Ultimately, 1000 participants were targeted. Recruitment took place in four major urban centers of Kazakhstan—Aktobe, Shymkent, Uralsk, and Kyzylorda—which collectively represent a significant portion of the older adult population (aged 65 and above) in western and southern regions of the country. The choice of these cities was guided not only by logistical considerations but also by the aim to capture potential interregional variations in health and social needs among the elderly.

In determining the distribution of participants across cities, the relative number of older people residing in each location was taken into account. Given that Shymkent is a city with over one million residents, and has a correspondingly large elderly population, the sample size there was set at 400 participants. In the other three cities—Aktobe, Uralsk, and Kyzylorda—200 participants were recruited per site, ensuring a proportionate and representative sample across diverse urban settings.

A total of 1050 individuals were approached for participation. Of these, 49 individuals were did not participated for various reasons. Consequently, data from 1000 older adults were successfully collected and included in the final analysis. This sample size exceeds the initially estimated minimum and provides a robust empirical basis for the statistical modeling and subgroup analyses performed in the study.

**Structure of the dissertation research:**

The dissertation research was structured into four main stages, each corresponding to one of the objectives formulated within this dissertation and implemented using an appropriate methodological approach:

Stage 1 – Linguistic and cultural adaptation

This stage involved the adaptation and validation of the EASYCare Standard 2010 questionnaire into Kazakh and Russian languages. Two separate validation studies were conducted (n = 100 for each language group) to ensure the reliability and cultural relevance of the instrument for use among the older adult population in Kazakhstan.

Stage 2 – Assessment of medical and social needs

Using the validated versions of the questionnaire, a cross-sectional survey was carried out to assess the physical, psychosocial, and functional status of older adults. The study was conducted in four cities (Aktobe, Uralsk, Shymkent, and Kyzylorda), with a total sample size of n = 1000.

Stage 3 – Statistical analysis of determinants

In this stage, univariable and multivariable statistical analyses were performed to identify the key factors influencing the three summary indices derived from the EASYCare tool. This stage was essential for understanding the predictors of medical and social needs in the elderly population.

Stage 4 – Synthesis and recommendations

The final stage focused on the integration of findings from the previous stages to formulate evidence-based recommendations for improving the system of medical and social monitoring and support for older adults in Kazakhstan.

At the first stage which corresponds to the first objective of the study, two pilot studies were conducted to validate the EASYCare Standard 2010 questionnaire in both Kazakh and Russian languages. A double forward and backward translation of the EASYCare Standard 2010 questionnaire was carried out to produce accurate Kazakh and Russian versions. The sample was drawn from the registered patient population of City Polyclinic №1. Using random number generation, 200 individuals aged 65 years and older without cognitive impairment were selected and agreed to participate in the survey. Questionnaires were administered twice to the same sample with an interval of 10–14 days. The Russian version was tested between September and December 2020, and the Kazakh version between May and September 2021. All participants were fully informed about the study's purpose and procedures, and informed consent was obtained. Exclusion criteria included acute conditions or exacerbation of chronic diseases requiring unplanned physician visits or hospitalization during the 2-week observation period. To assess validity, the following procedures were performed after test-retest administration: Spearman's correlation coefficient was calculated between the composite indices of the EASYCare questionnaire (Independence score, Risk of breakdown in care, and Risk of falls) and the reference functional assessment tools: Barthel Index (assessment of basic activities of daily living – ADL) and Lawton Scale (assessment of instrumental activities of daily living – IADL). Cohen’s Kappa coefficient was also calculated to assess the agreement and reliability of categorical responses.

As part of the second research objective, data were collected by a team of five researchers within the framework of the scientific and technical program (STP) during the COVID-19 pandemic in 2020 and 2021. The team members also provided clarifications to participants when necessary. Participant recruitment was carried out with the assistance of general practitioners, social workers, and nurses, whose role was limited to identifying eligible older adults from the attached population lists of polyclinics using a convenience sampling approach. Only individuals with full verbal communication and no cognitive impairments were invited to participate. A total of 49 individuals declined to participate, citing various reasons such as lack of time, fear of COVID-19 infection, or not responding to phone calls. No financial compensation was offered to participants. After verbal consent was obtained via phone, appointments were arranged either at participants’ homes or at polyclinics, as needed. Written informed consent was obtained from all participants after providing detailed information about the study objectives and procedures.

The final sample included 1000 participants, distributed as follows: 200 from Kyzylorda, 400 from Shymkent (South Kazakhstan), 200 from Uralsk, and 200 from Aktobe (West Kazakhstan). Data on the medical and social needs of older adults were collected using the EASYCare Standard 2010 questionnaire, which includes 7 sections and 49 items designed to assess needs for physical, psychological, and social support. The structure of the questionnaire encompasses a comprehensive range of domains relevant to the assessment of older adults. These include vision, hearing, and communication; self-care;

mobility; safety; the living environment and financial situation; health maintenance; and mental health and well-being.

Based on participants' responses, three summary indices were calculated:

- *Independence score* – Evaluates a person's level of independence in basic and instrumental activities of daily living (range: 0–100). Higher scores indicate greater dependence on others.
- *Risk of breakdown in care* – Assesses the risk of requiring 24-hour care (range: 0–12). Higher scores indicate increased risk of care breakdown.
- *Risk of falls* – Measures fall risk (range: 0–8). A score of 3 or more is considered to indicate elevated fall risk.

**Statistical analysis**

Statistical analyses were performed using STATISTICA 13.2 software (TIBCO Software, Poland). The normality of data distribution was assessed using the Shapiro–Wilk test. Descriptive statistics were reported as mean and standard deviation (SD) for normally distributed data, and as median and interquartile range (IQR) for non-normally distributed data.

Participant comparisons were made using the $\chi^2$ (Chi-square) test across the following socio-demographic groups: age (65–74 and 75+ years), sex (male and female), language (Kazakh-speaking and Russian-speaking respondents), and region of residence (southern and western Kazakhstan). These same groupings were used to analyze the three ECQ indices and to compare the needs of older adults across each section of the questionnaire, employing both the Mann–Whitney U test and Chi-square test.

To preliminarily assess the influence of individual socio-demographic and economic factors on the three key indices reflecting the medical and social needs of older adults—namely, independence level, risk of breakdown in care, and risk of falls—a univariable analysis was conducted. For each predictor (age, gender, education level, marital status, place of residence, financial situation, etc.), associations with the respective indices were calculated using the chi-square ($\chi^2$) test. The analysis showed that all examined variables, except for gender, demonstrated a statistically significant association with at least one of the three studied indices ($p < 0.05$). This indicates a close relationship between social determinants and the vulnerability level of older people, and therefore all these factors were included in the multivariable regression analysis.

A multivariable regression analysis (logistic regression) was used to assess the simultaneous relationship between multiple variables, indicating the odds ratio (OR) and the 95% confidence interval (CI). Median-split analysis was used to categorize participants based on individual index scores: continuous variables were divided into high and low groups based on the median value. Specifically, participants scoring above the median for the Independence Score index and the Risk of Breakdown in Care index were compared to those with median or lower scores. For the Risk of Falls index, participants were grouped into those at increased risk and those without risk.

To assess validity, Cophen's kappa was calculated to determine internal consistency, reflecting the ratio of the variance between scale items to the total variance of the instrument. Test-retest reliability was evaluated using the Wilcoxon signed-rank test, appropriate for paired nonparametric samples.

Construct validity was assessed by comparing EASYCare results with benchmark scales—the Barthel Index and the Lawton Scale—using Spearman's rank correlation coefficient, which is suitable for nonparametric data. A p-value < 0.05 was considered statistically significant.

**Results for Objective (1)**

**1.1. Validation of the Russian version of the ECQ**

Socio-demographic characteristics of participants: the average age of participants was 70.3 ± 5.2 years, ranging from 65 to 90 years (n = 100). Of the participants, 65% were women. Approximately 43% were single, the majority of whom were women (37%). More than half of the participants (N = 57) lived in extended families, while only eight individuals lived alone. This finding may reflect the cultural tradition in which older adults often live with their youngest sons and their families, who typically assume caregiving responsibilities in old age.

It is noteworthy that nearly 90% of respondents had completed either secondary or higher education, indicating a high level of educational attainment, including professional qualifications. Interestingly, 36 participants reported having disposable income at the end of the month, despite 85% of them being pensioners. This may be attributed to the financial support provided within extended family households by working-age adult children.

Self-assessment outcomes showed a strong relationship between the three summary indices of the primary ECQ assessment and the results obtained using the reference tools—the Barthel Index and the Instrumental Activities of Daily Living (IADL) Scale. The Independence Score demonstrated a strong negative correlation with both the Barthel Index ($r = –0.94$; $p = 0.000$) and the IADL scale ($r = –0.82$; $p = 0.000$). The Risk of Breakdown in Care Index showed a moderate negative correlation with the Barthel Index ($r = –0.62$; $p = 0.000$) and the IADL scale ($r = –0.49$; $p = 0.000$). Similarly, the Risk of Falls Index was negatively correlated with the Barthel Index ($r = –0.60$; $p = 0.000$) and the IADL scale ($r = –0.58$; $p = 0.000$). Spearman's rank correlation coefficient was used to assess these relationships, confirming the convergent validity of the Russian version of the ECQ.

When comparing results from two consecutive assessments on the Independence Score, Risk of Breakdown in Care, and Risk of Falls, no statistically significant differences were found: Independence Score: 10.4 ± 14.6 vs. 10.1 ± 14.2; Risk of Breakdown in Care: 3.9 ± 2.5 vs. 3.9 ± 2.5; Risk of Falls: 1.6 ± 1.5 vs. 1.6 ± 1.4. However, item-level analysis within the Independence Index revealed discrepancies in 11 individual items, with a trend toward higher scores during the second assessment (10.4 ± 14.6 vs. 10.1 ± 14.2; $p = 0.09$).

The most notable differences were observed in: "Do you have bladder accidents?" — 69 participants answered "No" in the second assessment compared to 66 in the first; "Can you use the toilet (or commode)?" — first assessment: 98 answered "Without assistance," 2 "With some assistance," and 2 "Unable" while in the second assessment: 96 "Without assistance," and 4 "With some assistance."

For the Risk of Breakdown in Care and Risk of Falls indices, differences were minimal. Overall, across all 49 items of the EASYCare questionnaire, high to excellent agreement was observed between the two assessments. Cohen's Kappa coefficients ranged from 0.89 to 0.99 across all domains, indicating a high level of internal consistency of the instrument. The combination of high Cohen's Kappa values (0.89–0.99) and strong Spearman's correlations between the EASYCare Standard 2010 and the Barthel and Lawton indices

provides strong evidence that the Russian version of the EASYCare Standard 2010 questionnaire yields reliable and valid results and is suitable for practical application.
The validation results of the Russian version of the EASYCare Standard 2010 were published in the journal *Phthisiopulmonology* in 2023.

**1.2. Validation of the Kazakh Version of the ECQ**

The average age of participants who completed the ECQ twice (n = 100) was 70.7 ± 4.6 years (median: 70; range: 65–85). Of these, 38 were men. The test-retest group did not differ significantly from the general study sample in terms of sex, place of residence, marital status, financial status, living arrangements, caregiving status, or receiving care. The only observed difference was in education level due to a higher proportion of respondents with primary education (14.0% vs. 31.7%) and a lower proportion with higher education (44.0% vs. 29.4%).

The Cronbach's alpha coefficient for the entire ECQ was 0.83, indicating good internal consistency. There were no significant differences observed in the Independence Score, Risk of Breakdown in Care, or Risk of Falls between the two assessments. Cohen's Kappa coefficient across all ECQ domains ranged from 0.81 to 0.95, reflecting almost perfect agreement.

The mean Barthel Index among participants was 94.0 ± 10.4 (median 100; range: 45–100), and the Lawton IADL Scale score averaged 7.5 ± 1.2 (median 8; range: 2–8). The Independence Score and Risk of Breakdown in Care demonstrated strong correlations with both the Barthel Index and the Lawton Scale, which are considered gold standards in the assessment of functional independence. A moderate correlation was found for the Risk of falls.

These findings demonstrate that the Kazakh version of the EASYCare Standard 2010 questionnaire possesses good to excellent psychometric properties and can thus be reliably used for the assessment of older adults' needs in Kazakhstan. The validation results of the Kazakh version of the ECQ were published in the international journal *Frontiers in Public Health*.

**Results for Objective 2:**

**2.1. Socio-demographic characteristics of study participants**

An analysis of the sample showed that the majority of respondents (80.3%) were aged 65–74 years, with women comprising the dominant group (77.2%). This aligns with demographic trends indicating that women generally have a longer life expectancy compared to men. A relatively high proportion of older adults (46.9%) lived in extended families, reflecting the continued importance of traditional family values in Kazakhstan. However, a significant proportion (43.6%) reported financial difficulties, which may negatively affect their social and medical well-being. Most respondents neither provided care to others (69.7%) nor received care themselves (65.4%), suggesting either a high degree of independence or a lack of formal social support systems. The substantial percentage of older adults experiencing financial hardship (43.6%) may also restrict access to essential healthcare and social services.

A comparative analysis revealed gender differences in health-related needs. Women had a higher level of functional dependency, which may be attributed to their longer life expectancy and age-related musculoskeletal changes. Analysis of the EASYCare Standard 2010 indices revealed that older adults in Kazakhstan are relatively independent:

Independence Score**:** 11.3 ± 13.1 (median: 7; range: 0–77), indicating a very good level of functional independence**.** Risk of Breakdown in Care: 2.9 ± 2.3 (median: 2; range: 1–11), suggesting a moderate need for ongoing support in some cases. Risk of Falls**:** 1.9 (median: 2; range: 0–7), reflecting a generally low fall risk among the older adult population in Kazakhstan.

**2.2. Needs assessment**

Analysis of the data revealed that the most pronounced needs among older respondents were in the domains of physical health maintenance (Area 6) and mental health and well-being (Area 7). The mean scores in these areas were 2.6 ± 1.4 and 2.7 ± 2.1, respectively, with needs reported by more than half of the participants (53.0% and 48.0%; $p < 0.0001$). Notably, men reported needs significantly more frequently than women across all seven domains ($p < 0.0001$), although the severity of needs, as reflected by median values, did not differ significantly between the sexes.

A substantial proportion of participants also reported needs in the areas of self-care (mean: 2.2 ± 2.4; 49.1%) and mobility (mean: 1.8 ± 1.9; 45.0%). These findings suggest common difficulties with personal hygiene, daily care routines, and mobility both inside and outside the home. These functional limitations are critical to an individual's independence and highlight the need for a multidisciplinary approach involving physicians, nurses, and social workers.

Although less pronounced, needs in the domains of vision, hearing, and communication (Area1), safety (Area 4), and housing and financial status (Area 5**)** remain relevant, with prevalence rates ranging from 35.0% to 37.8%. Taken together, these findings demonstrate a high prevalence of medical and social needs among older adults in Kazakhstan and reinforce the value of comprehensive, multidimensional assessment focused on physical, psychological, and social well-being.

**2.3. Indices: Independence score, Risk of breakdown in Care, and Risk of falls**

Based on the study findings, the three indices of the EASYCare Standard 2010 questionnaire provided a comprehensive assessment of older adults' overall condition. The mean Independence Score was 11.3 ± 13.1, reflecting a wide range of functional autonomy, with higher scores indicating greater dependency. The Risk of Breakdown in Care Index, averaging 2.9 ± 2.3, indicated that many older adults exhibited factors associated with declining health and an increased likelihood of hospitalization or the need for continuous care. The Risk of Falls Index was 1.9 ± 1.7, confirming a potential threat of injury due to falls in a significant portion of respondents.

All three indices showed statistically significant differences ($\chi^2$, $p < 0.0001$) and demonstrated their utility as effective tools for comprehensive geriatric assessment.

A comparative analysis using the Mann–Whitney test revealed regional differences between western and southern Kazakhstan. The Risk of Falls was found to be higher in the western region (2.0) compared to the southern region (1.9) ($p = 0.01$).

**Results for Objective 3:**

**3.1. Univariable analysis of the Independence score**

Univariable analysis revealed that age, educational level, and region of residence had statistically significant effects on the level of independence among older adults. Individuals aged 75 years and older had significantly lower independence scores compared to those aged 65–74 years ($p = 0.0001$). A clear association was found between educational

attainment and independence: the lower the level of education, the higher the level of dependency on others ($p < 0.0001$). Respondents from southern Kazakhstan demonstrated lower independence compared to those from the western region ($p = 0.0045$), which may reflect disparities in access to social and healthcare services. There was also a trend toward reduced independence among unmarried older adults ($p = 0.0699$), although this did not reach statistical significance. Other factors—including sex, living arrangement, financial situation, caregiving status (both giving and receiving care), and language of communication—did not have a statistically significant impact on the level of independence.

**Univariable analysis of the Risk of breakdown in care index**

Univariable analysis identified statistically significant associations between the risk of breakdown in care and several factors, including age, marital status, living arrangements, and educational level. Older adults aged 75 and above were more likely to experience a breakdown in care compared to the younger group aged 65–74 ($p = 0.0006$). Also, unmarried participants had a significantly higher risk compared to those who were married ($p = 0.0016$). Moreover, living arrangements also played a significant role: individuals living with a spouse or in extended families were less likely to fall into the high-risk category ($p = 0.0246$) and a statistically significant effect of education was also observed: participants with lower educational attainment showed a higher risk of care breakdown ($p = 0.0421$). Other variables—including sex, financial situation, presence or absence of caregiving support, language of communication, and region of residence—did not have a statistically significant impact on this index.

**Univariable analysis of the Risk of falls index**

The analysis showed that the risk of falls among older adults was significantly associated with marital status, living arrangements, educational level, financial security, and caregiving responsibilities. Older adults living alone had a significantly higher risk of falls compared to those living with family ($p < 0.0001$), which was consistent with findings by marital status—where unmarried individuals also had a higher fall risk ($p = 0.0001$). A lower level of education was associated with an increased fall risk ($p < 0.0001$), and financial insecurity had a similarly strong negative impact ($p = 0.0001$). Interestingly, individuals who provided care for others were more likely to report a higher risk of falling ($p = 0.0022$), possibly due to physical or emotional strain from caregiving tasks.

Other factors—including sex, language spoken, receiving support from family, and region of residence—did not show statistically significant associations with fall risk.

### 3.2. Multivariable regression analysis

Following the univariable regression analysis, a multivariable logistic regression was conducted to identify the factors influencing the three indices: Independence Score, Risk of Breakdown in Care, and Risk of Falls. The analysis included the following independent variables: age, sex, marital status, level of education, financial situation, living arrangements, language spoken, region of residence. The associations were evaluated using odds ratios (OR), 95% confidence intervals (CI), and p-values to determine statistical significance.

**Independence score**

The analysis results showed that reduced independence was statistically significantly associated with age, level of education, and region of residence. Older adults aged 75 years and above had a 40% higher risk of reduced independence compared to those aged 65–74

(OR = 1.40; 95% CI: 1.01–1.94; $p = 0.046$). It was also found that a low level of education was a significant factor increasing the likelihood of functional dependency: individuals with only primary education had a 52% higher risk compared to those with secondary education (OR = 1.52; 95% CI: 1.11–2.07; $p = 0.009$), and an 89% higher risk compared to those with higher education (OR = 1.89; 95% CI: 1.36–2.62; $p < 0.001$). Additionally, region of residence was shown to have a significant impact: respondents from southern Kazakhstan were 58% more likely to have reduced independence compared to those from the western region (OR = 1.58; 95% CI: 1.20–2.07; $p = 0.001$).

**Risk of breakdown in care**

The analysis of factors associated with the risk of breakdown in care, conducted using multivariable logistic regression, revealed that age was the only statistically significant predictor. According to the findings, increasing age significantly raised the likelihood of care breakdown: the odds ratio was 1.57 (95% CI: 1.14–2.18; $p = 0.007$), indicating a 57% increase in risk for each unit increase in age. Other variables—including marital status, living arrangements, educational level, financial situation, and language spoken—did not demonstrate statistically significant associations with the risk of care breakdown ($p > 0.05$). However, there was a trend toward increased risk among individuals with lower educational attainment, both compared to those with secondary education (OR = 1.36; 95% CI: 0.99–1.87; $p = 0.062$) and higher education (OR = 1.35; 95% CI: 0.97–1.87; $p = 0.076$), suggesting a potentially important role for this factor in larger samples. Marital status also approached statistical significance (OR = 0.74; 95% CI: 0.52–1.04; $p = 0.084$), which may indicate a protective effect of being married. These findings highlight the need for further investigation into the social and educational determinants of care breakdown risk, particularly in the context of an aging population.

**Risk of falls**

Multivariable regression analysis of factors associated with fall risk among older adults identified several statistically significant predictors. Marital status was found to be a significant factor: individuals who were married had a lower risk of falling compared to those who were single (OR = 1.54; 95% CI: 1.07–2.23; $p = 0.021$), which may be related to the presence of social and physical support from a spouse. Educational level also showed a strong association: having only primary education, compared to complete secondary education (OR = 1.83; 95% CI: 1.31–2.56; $p < 0.001$) or higher education (OR = 1.75; 95% CI: 1.24–2.48; $p = 0.002$), was associated with a significantly increased risk of falling. These findings reinforce the importance of education as a factor influencing self-regulation, awareness of fall prevention measures, and overall activity level in daily life.

In addition, financial status was found to play a significant role: a low level of material security increased the risk of falls by nearly 1.5 times (OR = 1.58; 95% CI: 1.19–2.11; $p = 0.001$), likely due to limited access to healthcare, rehabilitation resources, and assistive devices.

At the same time, variables such as area of residence (urban vs. rural), living arrangement (alone, with a spouse, or with extended family), and caregiving status (either providing or receiving care from relatives or friends) did not show statistically significant associations with fall risk ($p > 0.05$). Nevertheless, some of these factors—such as living with extended family—may have potential relevance and warrant further investigation in larger samples.

Thus, multivariable analysis of the three key indices—Independence Score, Risk of Breakdown in Care, and Risk of Falls—showed that age, educational level, and socio-territorial conditions play an essential role in shaping the health status of older adults. Reduced independence was significantly associated with being aged 75 and older (OR = 1.40; $p = 0.046$), low educational attainment (OR = 1.52–1.89; $p \leq 0.009$), and residence in southern regions of Kazakhstan (OR = 1.58; $p = 0.001$). The Risk of Breakdown in Care increased with age (OR = 1.57; $p = 0.007$). Elevated Risk of Falls was strongly associated with being unmarried (OR = 1.54; $p = 0.021$), lower education (OR = 1.75–1.83; $p < 0.001$–0.002), and adverse financial conditions (OR = 1.58; $p = 0.001$).

**Based on the results of the conducted study, the following conclusions were drawn:**

1. Cohen's Kappa coefficient ranged from 0.81 to 0.95 across all sections of the Kazakh version and from 0.89 to 0.99 in the Russian version, indicating almost perfect agreement across all sections of the EASYCare Standard 2010 questionnaire. The average Barthel Index among the assessed individuals was 94.0 ± 10.4, and the Lawton scale score was 7.5 ± 1.2 in the Kazakh version, while in the Russian version, the values were 93.3 ± 10.9 and 5.9 ± 1.7, respectively. The Independence Score, Risk of Breakdown in Care, and Risk of Falls indices showed good correlation with the Barthel Index and Lawton Scale, which are considered the gold standards for assessing functional independence.

2. Older adults have significant medical and social needs: 49% require assistance with self-care, 53% with health maintenance, and 48% with psychosocial support ($p < 0.0001$). This underscores the need for a comprehensive approach to ensuring their well-being. A regional comparison showed that the risk of falls is higher in the western region compared to the southern region (2.0 vs. 1.9 and 1.8 vs. 1.6, respectively; $p = 0.01$).

3. Age, educational level, and socio-territorial conditions play a significant role in determining the three key indices: Independence Score, Risk of Breakdown in Care, and Risk of Falls. Reduced independence was statistically significantly associated with being aged 75 and older (OR = 1.40; $p = 0.046$), low educational attainment (OR = 1.52–1.89; $p \leq 0.009$), and residence in the southern regions of Kazakhstan (OR = 1.58; $p = 0.001$). Risk of Breakdown in Care increased with age (OR = 1.57; $p = 0.007$). An elevated Risk of Falls was significantly associated with being unmarried (OR = 1.54; $p = 0.021$), low educational level (OR = 1.75–1.83; $p < 0.001$–0.002), and unfavorable financial conditions (OR = 1.58; $p = 0.001$).

4. Based on the integration of the first, second, and third research objectives, the following practical recommendations were formulated:

• When revising the Standard for the Organization of Geriatric and Gerontological Care in the Republic of Kazakhstan (Order No. 55 dated June 23, 2021), it is recommended to consider the implementation of the EASYCare Standard 2010 questionnaire in the clinical practice of general practitioners and geriatricians. This tool enables a comprehensive assessment of older patients' health status and timely identification of risks related to functional dependence and falls.

• It is proposed to use the indexes "Independence Score," "Risk of Breakdown in Care," and "Risk of Falls" as screening instruments to determine the priority level of monitoring and the extent of intervention within nursing and home visit services.

• Key social and territorial determinants (age, education, and region of residence) must be considered when developing geriatric care programs and allocating resources—especially with a focus on southern regions, where a higher level of functional dependence among the elderly is observed.

• It is recommended to strengthen social support for older adults living alone, especially those in high-risk categories for falls and breakdowns in care. Developing programs for remote monitoring, outreach, and targeted assistance is advisable for this group.

• Financial status should be included as a mandatory component in the vulnerability assessment of older people within an integrated geriatric care model. Financial insecurity is directly associated with increased risk of falls and overall health deterioration.

• It is recommended to develop adapted educational programs on self-care and fall prevention targeting elderly individuals with lower levels of education, considering their functional and cognitive literacy. Educational materials should be simple, visual, and culturally appropriate.

• Further research among the elderly population is essential to accurately define their medical and social needs, which will support the development of evidence-based prevention, care, and active aging programs.