

ABSTRACT

the dissertation by Namazbayeva Zhanar Yertayevna
on the topic: " **Improving the organization of activities of primary care
specialists in assessing risk factors for digestive diseases among the population of
Zhambyl region**", submitted for the degree
of Doctor of Philosophy (PhD) in the educational program 8D10101 - Public
Health

Relevance of the research topic

The major health burden of the second half of the 20th and early 21st centuries is represented by chronic noncommunicable diseases (NCDs), which remain one of the most critical challenges facing modern society (Lancet, 2016).

According to World Health Organization (WHO), 71% of all annual deaths equal to 41 million cases are caused by NCDs (WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020).

NCDs account for approximately 84% of all deaths in the Republic of Kazakhstan (WHO, 2014). According to the WHO, the probability of premature mortality before the age of 70 is associated with five major NCDs groups: cardiovascular diseases, diabetes mellitus, chronic respiratory diseases, cancer and digestive diseases (WHO, 2016) [1].

Diseases of the digestive system (DDS) remain a highly relevant problem for clinical medicine, attracting the attention of both practicing physicians and healthcare administrators [2]. Worldwide, the number of individuals suffering from gastrointestinal and hepatobiliary disorders increases annually [3].

According to WHO experts, by the middle of the 21st century digestive diseases will rank among the leading causes of morbidity, driven by modern lifestyle factors (stress, unhealthy diet, physical inactivity, and harmful habits), environmental pollution, and increased consumption of low quality and genetically modified foods (World Health Statistics) [4].

An analysis of the current situation under the former State Program for Healthcare Development of the Republic of Kazakhstan 2020–2025 showed that the primary burden of NCDs in Kazakhstan results from seven major risk factors: elevated blood pressure, tobacco use, alcohol consumption, high blood cholesterol, overweight, insufficient fruit and vegetable intake and excessive salt consumption. Salt intake in Kazakhstan exceeds WHO recommendations by up to four times (up to 20 g/day) and daily fruit and vegetable consumption is lower than the European average.

Kazakhstan remains a “blind spot” on the global epidemiological map, especially regarding epidemiology of NCDs, including DDS. Medical statistics for NCDs, including digestive diseases, is based on non-standardized indicators that hinder cross-country comparisons and accurate regional assessment. Moreover, morbidity indicators in Kazakhstan reflect healthcare utilization rather than true prevalence. Accurate epidemiological data should rely on national-level studies, which have not been conducted regularly [5].

People at risk of NCDs

Individuals of all ages, regions, and countries are affected by NCDs. Although these diseases are often associated with older age, more than 15 million NCDs-related deaths occur between ages 30 and 69. An estimated 85% of these premature deaths occur in low- and middle-income countries.

Children, adults, and the elderly are vulnerable to NCDs risk factors, including unhealthy diet, physical inactivity, tobacco smoke exposure, and harmful alcohol use.

These diseases are caused by factors such as rapid unplanned urbanization, globalization of unhealthy lifestyles, and population aging. Poor diet, excessive salt intake, insufficient physical activity, elevated blood pressure, hyperglycemia, and dyslipidemia contribute to obesity, cardiovascular disorders, and digestive diseases.

Nursing for NCDs includes:

- Increasing patient awareness about the disease and its risk factors;
- Enhancing patient responsibility for personal health;
- Promoting rational and active attitudes toward disease management, increasing motivation, adherence to treatment, and compliance with medical recommendations;
- Developing patient skills in health monitoring and basic pre-medical care during exacerbations;
- Forming behavioral self-correction skills (nutrition, physical activity, stress management, rejection of harmful habits, etc.);
- Developing practical skills for creating personalized wellness plans;
- Providing patient-centered care considering health status, cultural context, age, abilities, and individual needs.

According to the American Association of Nurse Practitioners, nearly 90% of practicing nurses are trained to assume roles in NCDs prevention and care at the primary healthcare level (pubmed.ncbi.nlm.nih.gov/30015724).

The reform of the nursing service plays a crucial role in Kazakhstan's healthcare system, helping compensate for physician workforce shortages at the primary care level (Code of the Republic of Kazakhstan “On Public Health and Healthcare System,” Article 127. Nursing Practice).

Risk Factors

Modifiable behavioral risk factors

Modifiable behaviors such as tobacco use, physical inactivity, excessive salt consumption, unhealthy diet, and harmful alcohol use significantly increase the risk of NCDs.

- More than 7.2 million deaths annually are attributed to tobacco (including second-hand smoke exposure).
- 4.1 million deaths annually are associated with excessive salt/sodium intake.
- Over half of 3.3 million alcohol-related deaths are linked to NCDs.
- 1.6 million deaths annually are associated with insufficient physical activity.

WHO Leadership and Coordination

The 2030 Agenda for Sustainable Development recognizes NCDs as a major threat to sustainable development. World leaders committed to reducing premature mortality from NCDs by one-third by 2030 through prevention and treatment (SDG

target 3.4). This goal was reaffirmed in UN High-Level Meetings on NCDs (2011, 2014), emphasizing WHO's global coordinating role.

WHO developed the Global Action Plan for the Prevention and Control of NCDs 2013–2020, containing nine global targets with the strongest impact on NCDs mortality [6].

The dissertation work was conducted within the scientific-technical program “National Program for Implementing Personalized and Preventive Medicine in the Republic of Kazakhstan”, under subtask 1.1 “Conduct an epidemiological study of socioeconomic, psychosocial, and behavioral factors affecting population health in Kazakhstan, with subsequent development of management solutions (Zhambyl Region).”

Purpose of the Study

To develop scientific and methodological approaches for the prevention of digestive diseases at the primary healthcare level in the Zhambyl Region.

Research objectives

1. To conduct an epidemiological analysis of morbidity and mortality from digestive diseases in Kazakhstan and the Zhambyl Region, including terms of nosology;

2. To assess behavioral risk factors like salt, alcohol, tobacco in the population of the Zhambyl Region using the WHO STEPS questionnaire (n=1201; n=391);

3. To assess the level of involvement of nurses in prevention of risk factors for digestive diseases;

4. To develop a set of methodological materials for digestive disease prevention for primary health care specialists.

Research Methods

Study design: Cross-sectional study.

Quantitative analysis: the following statistical criteria were used in the study: parametric criteria Student's t-test for paired comparisons and one-way analysis of variance for group comparisons (more than 2) were used in data processing. The nonparametric Mann-Whitney U test and the Kruskal-Wallis test are analogs of parametric tests. The statistical significance level is 5%.

Qualitative analysis: Qualitative variables are coded. For qualitative data: Pearson chi-square test. P-value of <0.05 is considered statistically significant. Statistical analysis was performed using IBM SPSS 20.0 (IBM Ireland Product Distribution Limited, Ireland). Sample Size Calculation for X-Sectional Surveys (n=391) was used to determine the sample size. According to the Ministry of Healthcare of the Republic of Kazakhstan's distribution within the Terms of Reference, the sample size was n=1201.

Object of the Study

Primary healthcare organizations of the Zhambyl Region: City Polyclinic №5 (Taraz), City Polyclinic №7 (Taraz), Central Hospital of Talas (Karatau), Central Hospital of Baizak (Sarykemer).

Scientific novelty of the research

1. A detailed epidemiological analysis of digestive diseases by urban/rural population for Kazakhstan and Zhambyl Region, including nosological distribution.
2. First-time results in Kazakhstan on NCDs risk factors and the influence of social and behavioral factors on health in the Zhambyl Region.
3. First-time results from the author-developed questionnaire “Questionnaire to identify risk factors for the development of non-communicable diseases” used to identify significant risk factors for DDS.
4. Development and approval of methodological recommendations “Methodological approaches to the prevention of non-communicable diseases at the primary health care level”.
5. Development of an effective patient routing system to optimize resource use and improve quality of care.

Practical significance of the work:

The practical significance of the research lies in the fact that the epidemiological analysis of DDS in the region, as well as the comparative assessment with national indicators and the identification of key behavioral risk factors, provides a clear understanding of the scale of the problem and its specific features. This indicates an urgent need for the development and implementation of targeted preventive programs. It is necessary to train primary healthcare nurses in counseling methods on nutrition and healthy lifestyle, and to strengthen their awareness of specific risks characteristic of the Zhambyl Region. The developed patient routing scheme represents a comprehensive and systematic tool that enables more effective identification of risk groups and supports individualized lifestyle modification. Its focus is on disease prevention and health promotion.

The main provisions submitted for defense

1. Against the background of increasing primary morbidity rates of DDS nationwide, an increase in primary digestive disease morbidity is also observed in the Zhambyl Region. With the overall rise in DDS-related mortality in Kazakhstan, the Zhambyl Region demonstrates elevated mortality indicators. An increase in mortality among both urban and rural populations was recorded in 2020.
2. Excessive salt consumption is widespread among the population of the Zhambyl Region and contributes to the development of digestive diseases.
3. A low level of awareness of behavioral risk factors for DDS was identified among respondents. Only 16.9% of primary healthcare workers engage in delivering information regarding prevention of NCDs risks, including DDS.
4. Patient routing at the primary healthcare level will help minimize efforts and improve the efficiency of obtaining information on DDS risk factors.

Description of the main results of the study

1. The first objective of the study involved a comprehensive assessment of the epidemiological characteristics of DDS. While the primary incidence of gastrointestinal diseases increased by 14.6% across the republic, from 3,632.2 (in 2011) to 4,164.8 (in 2020), the primary incidence of gastrointestinal diseases in the Zhambyl region increased by 29.2%, from 3,607.0 (in 2011) to 4,662.2 (in 2020). A study of mortality rates in the Zhambyl region revealed a 24.8% decrease (from 83.28

(2011) to 62.57 (2020) per 100,000 population). A decrease in mortality rates was also observed in both the urban (23.1%) and rural (35.0%) populations. An epidemiological analysis of the main nosologies of gastroesophageal reflux disease (GERD) morbidity revealed a significant decrease in the incidence of GERD in rural areas (by 41.2%) and in the region (by 41.7%). Gastric ulcer and duodenal ulcer are characterized by stability, with a slight overall increase over the period: with an increase in the city (by 1.7%) and a decrease in the countryside (by 2.4%). In the presented sample, gastritis and duodenitis are the most common diseases, with a significant decrease in incidence in the urban population (by 27.7%). Gallstone disease, cholecystitis, and cholangitis are characterized by high correlations and a significant increase in rural areas (by 11.4%). Pancreatitis shows the most significant increase in incidence in rural areas (by 61.8%) and a decrease in urban areas (by 2.5%).

In terms of overall morbidity, the largest share was accounted for by cholelithiasis (42.7%) and gastritis (38.1%), pancreatitis (10.1%), peptic ulcer disease (7.2%), and GERD (1.9%). In the adult population, a significantly higher proportion was accounted for by cholelithiasis (45.9%) and gastritis (32.7%), pancreatitis (11.3%), peptic ulcer disease (8.3%), and GERD (1.8%). Among adolescents, the highest prevalence is gastritis (65.4%), followed by cholelithiasis (22.1%), pancreatitis (6.2%), peptic ulcer disease (5.3%), and GERD (1%). Among children, the highest prevalence is gastritis (61.3%) and cholelithiasis (30.5%). Pancreatitis (4.5%), peptic ulcer disease (1.0%), and GERD (2.6%) also have smaller prevalence.

2. The second objective of the study was to assess behavioral factors for the consumption of salt, alcohol and tobacco among residents of the Zhambyl region using the standardized and adapted STEPS questionnaire of the World Health Organization (n=1201). An assessment of population risk factors in the Zhambyl region revealed that the majority of the population (65.9%) adds salty spices during cooking. Reducing salt intake is especially important for women (42.8%), while for men, it's 25.5%. 77.3% of respondents stated that consuming large amounts of salt or salty sauces causes serious health problems, indicating statistical significance. A survey of tobacco smoking status revealed that 250 (20.8%) respondents currently smoke. First time smoked at age 19. The number of cigarettes smoked per week was 81. Eighty-nine (51.1%) men and 34 (44.7%) women tried to quit. Over the past 12 months, 65.1% (n = 309) drank at least one standard drink of alcohol less than once a month, including 115 (52.5%) men and 194 (75.8%) women. The majority of respondents (50.9%) have ever consumed alcohol in their lives, of which the largest number are men (60.8%). A study of risk factors influencing the development of DDS revealed (n=391) that the majority of respondents (31.2%) consume food in excess and do not adhere to a certain (correct) diet (26.6% of respondents). Moreover, 24% of respondents frequently consume baked goods and baked goods, while 31.2% of residents frequently consume carbonated drinks and energy drinks. Fast food predominates in the daily diet of 30.1% of respondents. Regarding salt consumption in grams, it should be emphasized that 42.5% of respondents do not know how many grams of salt they consume per day, 31.5% add up to 20 grams per day, which corresponds to two tablespoons of salt per day, which shows statistical significance. According to WHO recommendations, only 2% of the

population consumes up to 5 grams of salt per day. Moreover, 31% of respondents always add salt or salty sauces to their meals. 89% add up to 2 teaspoons of sugar.

3. In the context of the third objective, according to the survey data in the Zhambyl region, recommendations received from healthcare workers regarding health risks showed a low percentage of public awareness of risk factors for the development of DDS. Only 16.9% of primary care healthcare workers engage in educational outreach regarding the prevention of NCDs risks, including DDS. In a survey on the importance of healthcare workers' recommendations regarding health risks, all respondents' responses were statistically significant: stopping tobacco use was significant for 25.7% of men and 11.6% of women; reducing salt intake was significant for 28.8% of men and 38.2% of women; eating at least five servings of fruit or vegetables daily was significant for 27.0% of men and 41.4% of women; reducing fat intake in food is significant for 34.5% of men and 53.3% of women; exercising or increasing physical activity is significant for 34.5% of men and 42.5% of women; maintaining a healthy weight or losing weight is significant for 32.3% of men and 43.9% of women.

4. As part of the fourth task, we studied the current situation regarding the provision of preventive examinations of the population, including the automation of preventive measures at the primary health care level. Based on the data obtained, an educational program for a seminar-training on dynamic monitoring of patients with chronic diseases of the digestive system was developed among nurses with an applied and academic bachelor's degree level with the aim of introducing independent nursing practice "Independent Nursing Practice in Outpatient Settings" (18 academic hours), which can improve the level of qualification in the disciplines of "General Practitioner" and "Nursing". "Independent nursing practice in outpatient settings" is a timely and necessary measure aimed at modernizing the healthcare system, improving the quality and accessibility of medical care and also to develop the professional potential of nurses, which will ultimately lead to improved public health.

A patient routing scheme with risk factors for gastrointestinal diseases at the primary health care level has been developed. This scheme represents a comprehensive algorithm of actions aimed at the timely identification, assessment, and correction of risk factors for the development of gastrointestinal diseases at the primary health care level. It covers measures to identify risk groups and individual approaches to lifestyle modification and disease prevention at the pre-hospital level.

Methodological recommendations "Methodological approaches to the prevention of non-communicable diseases at the primary health care level" have been developed, which outline the responsibilities of healthcare organization employees at the primary health care level.

Conclusions

1. Epidemiological Analysis. A comprehensive evaluation of the epidemiology of DDS was conducted. Nationwide primary morbidity increased by 14.6% (from 3632.2 in 2011 to 4164.8 in 2020). In the Zhambyl Region, this increase was 29.2% (from 3607.0 in 2011 to 4662.2 in 2020). Mortality from DDS in the Zhambyl Region decreased by 24.8% (from 83.28 in 2011 to 62.57 per 100,000 population in 2020).

Both urban mortality (23.1%) and rural mortality (35.0%) declined. Nosological analysis showed: gastroesophageal reflux disease (GERD) significantly decreased in rural areas (41.2%) and across the region (41.7%). Peptic ulcer disease remained stable: slight increase in urban areas (1.7%) and slight decline in rural areas (2.4%). Gastritis and duodenitis were most prevalent, with a major decrease among the urban population (27.7%). Gallstone disease, cholecystitis, and cholangitis demonstrated high correlations and significant growth in rural areas (11.4%). Pancreatitis exhibited the sharpest increase in rural areas (61.8%), while decreasing in urban populations (2.5%).

2. Assessment of behavioral risk factors (n =1201; n = 391) STEPS questionnaire data showed: 65.9% add salty seasonings during food preparation. Women consider salt reduction more important (42.8%) than men (25.5%). 77.3% acknowledge that excess salt causes serious health problems. 20.8% currently smoke; the average age of first smoking is 19 years. A study of risk factors influencing the development of DDS revealed that the majority of respondents (57.8%) consume food in excess, without adhering to restrictions, while they often consume bakery and flour-confectionery products - 24%, moreover, 32.5% of residents often consume carbonated drinks and energy drinks. For 30.1% of respondents, fast food predominates in their daily diet. Salt or salty sauces are always added by 31%, while only 2% consume up to 5 grams. Furthermore, 42% of the Zhambyl region's population is unaware of their daily salt intake in grams.

3. Nurse Involvement in Risk Prevention.

Only 16.9% of primary health care medical workers provide counseling on NCDs risk factors, including DDS. Respondents rated recommendations as follows (statistically significant): Smoking cessation: important for 25.7% of men, 11.6% of women. Salt reduction: 28.8% men, 38.2% women. Daily fruit/vegetable intake: 27.0% men, 41.4% women. Fat reduction: 34.5% men, 53.3% women. Increased physical activity: 34.5% men, 42.5% women. Weight control: 32.3% men, 43.9% women. The data obtained allow us to confidently state that preventive work by primary health care workers of Zhambyl region is poorly organized and the majority of the population is not informed about the risks of developing NCDs.

4. Development of a Training Program and Routing Scheme.

An educational 18-hour training program “Independent Nursing Practice in Outpatient Settings” was developed to improve competencies of applied and academic bachelor-level nurses in dynamic follow-up of DDS patients. The program enhances qualifications in the disciplines “General Practitioners” and “Nursing”. The routing scheme is a comprehensive algorithm of actions aimed at the timely identification, assessment and correction of risk factors for the development of gastrointestinal diseases at the primary health care level. It covers both screening measures to identify risk groups and individual approaches to lifestyle modification and disease prevention.

The program supports modernization of healthcare, improving service quality, accessibility, and nursing professional capacity.

A patient routing scheme for DDS risk factors at the PHC level was developed, presenting a comprehensive algorithm for early detection, assessment, and correction of digestive disease risk factors.

Approbation of dissertation work.

Key findings were presented at scientific conferences, academic meetings of the Department of Public Health and Social Sciences and through media channels.

Presentations were delivered at:

- International Scientific-Practical Conference of Young Scientists (April 12, 2022, Almaty);
- International Forum “Science and Innovations – Modern Concepts” (May 20, 2022, Moscow);
- Live interview on “TRK Eurasia” (“Good morning, Kazakhstan”) (July 19, 2022);
- Live interview on “TRK Shalkhar radiosy” (February 22, 2023);
- International Conference “Foundations and Trends in Modern Learning” (Berlin, April 2023);
- International Scientific Conference “Research Reviews” (Prague, November 2023) ;
- VIII Central Asian Gastroenterology Week – 3rd place in Young Scientists Section (Almaty, 2023;
- I International Conference “Science and Youth” (Almaty, April 2024).

Published works related to the dissertation research

The dissertation results were published in: 8 scientific papers, including 3 in journals recommended by the Committee for Quality Assurance in Science and Higher Education (Kazakhstan).

1 article in international journal indexed in Scopus and Web of Science:

1. International Journal of Environmental Research and Public Health (CiteScore 7.3, 86th percentile, WoS Q1); Additionally:
- 4 conference theses (international);
 - 2 certificates of authorship (№ 23409; № 28879);
 - 5 implementation acts in healthcare organizations.

The author's personal contribution to the research.

The dissertation is the author's independent work. The author conducted literature review, planned and executed all stages of the research.

As a result of the work, the author developed an additional questionnaire in Russian and Kazakh: author's certificate № 23409 dated 08.02.22 “Questionnaire for identifying risk factors for the development of non-communicable diseases” (Application A).

The author made an independent visit to the Zhambyl region as part of a temporary research team of Higher School of Public Health (KSPH) to study the risk factors of non-communicable diseases, namely, diseases of the digestive system, by conducting monitoring within the framework of a scientific and technical program (Application D).

Methodological recommendations "Methodological approaches to the prevention of non-communicable diseases at the primary health care level" have been developed and approved within the framework of the scientific and technological program "National program for the implementation of personalized and preventive medicine in the Republic of Kazakhstan" (The methodological recommendations were

discussed and approved at the meeting of the Academic Council of the KSPH protocol of meeting № 2 dated April 16, 2024) (Application E).

These methodological recommendations have been implemented in the following primary health care organizations in Almaty and the Zhambyl region: City Polyclinic № 29" Almaty; City Polyclinic № 7 Taraz; City Polyclinic № 5 Taraz; Central Hospital of Talas, Karatau; Central Hospital of Baizak, Sary-Kemer (Application B).

An educational program for the seminar-training has been developed: author's certificate № 28879 dated September 19, 2022, "Independent nursing practice in outpatient settings," 18 academic hours, which outlines the role of advanced practice nurses in the admission of patients with NCDs, namely, diseases of the digestive system (Discussed and approved by the training and methodological center, minutes of meeting №6 dated June 30, 2022) (Application G).

Structure and volume of the dissertation

The dissertation comprises 132 pages (excluding appendices), including introduction, literature review, materials and methods, results, conclusion, findings, practical recommendations, and a reference list of 165 sources. It includes 28 tables, 25 figures and 6 applications.