ANNOTATION

of the dissertation work by Shaki Dinara Talgatkyzy on "Quality and accessibility of Primary Health Care during the COVID-19 Epidemic" , submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy (PhD) in the specialty 8D10101 – "Public Health"

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Relevance of the Research Topic

The COVID-19 pandemic has had an unprecedented impact on healthcare systems worldwide, exposing structural vulnerabilities and limited capacity in responding to public health emergencies. A particular burden was placed on primary health care (PHC), which represents the first point of contact between the population and the healthcare system and plays a key role in ensuring accessibility, continuity, and coordination of medical services [1].

International experience has demonstrated that countries with well-developed and resilient PHC systems, as well as those with prior experience in managing infectious disease outbreaks, showed higher preparedness and effectiveness in responding to the pandemic by ensuring timely diagnosis, patient referral, and continuity of essential health services. In contrast, countries with underdeveloped primary care infrastructure faced significant challenges in maintaining the quality and accessibility of healthcare services [2,3,4].

In the Republic of Kazakhstan, the COVID-19 pandemic led to a substantial reallocation of healthcare resources toward anti-epidemic measures, resulting in restrictions on elective care, reduced coverage of preventive services, and disruption in the follow-up of patients with chronic diseases [5]. At the same time, the role of PHC increased in early case detection, outpatient management of patients, and reduction of the burden on hospital care [6]. However, insufficient coordination between primary care and hospital services remained a key challenge [7]. Weak intersectoral cooperation further complicated epidemic response efforts. In addition, low public trust in healthcare institutions and fear of infection among both patients and healthcare workers contributed to delays in seeking medical care, which led to reduced access to essential services, including maternal and child health care, chronic disease management, and care for elderly populations [8].

Despite ongoing reforms in the healthcare system, issues related to the quality and accessibility of PHC during epidemic conditions remain insufficiently studied, particularly in the context of national and regional specificities. The lack of comprehensive assessment of factors influencing PHC performance under crisis conditions limits the development of evidence-based management strategies [9].

Therefore, this study, aimed at assessing the quality and accessibility of primary health care during the COVID-19 pandemic in the Republic of Kazakhstan, is highly relevant and holds significant scientific and practical importance for strengthening the resilience of the healthcare system to future public health emergencies.

The purpose of the study: To improve the efficiency of the primary health care (PHC) system in emergency epidemiological situations based on the analysis of the COVID-19 pandemic experience and the assessment of patient satisfaction.

Research objectives:

1. To study international and domestic experiences of PHC organizations in the context of the COVID-19 pandemic.

2. To assess patient satisfaction with the quality and accessibility of primary health care during the COVID-19 pandemic.

3. To identify factors influencing the effectiveness of PHC activities during the COVID-19 pandemic.

4. To develop measures to improve the accessibility and quality of primary health care in epidemic conditions.

Materials and Research Methods

The study was conducted using a mixed-method design, including both quantitative and qualitative approaches.

At the first stage, a systematic review of international and domestic scientific literature on the organization of primary health care in pandemics and crisis situations was carried out.

At the second stage, a cross-sectional sociological survey of patients was conducted among 1,350 respondents. The study was implemented in eight primary health care (PHC) organizations located in eight administrative districts of Almaty. Data were collected through an online survey between June 30 and December 31, 2021. The survey included patients who applied to outpatient facilities during the specified period. The inclusion criteria were: age over 18 years, registration with selected PHC organizations, and voluntary informed consent to participate in the study. Patients who were unable to respond due to health conditions were excluded.

At this stage, the sample size was determined using the OpenEpi program. A total of 1,350 respondents participated in the survey, with a response rate of 83%.

The study was approved by the Local Ethics Committee of the Kazakh National Medical University named after S.D. Asfendiyarov (Protocol No. 8, dated June 30, 2021).

For statistical analysis, descriptive statistics, the chi-square (χ^2) test, Cramer's V coefficient, and logistic regression analysis were used.

The qualitative component of the study included a focus group discussion with 10 PHC physicians to achieve the third objective of the study. Thus, the empirical base consisted of two main groups of respondents: patients as consumers of health services who assessed the quality and accessibility of primary health care during the COVID-19 pandemic, and PHC physicians as a professional group whose opinions reflected the organizational and practical aspects of PHC delivery in epidemic conditions.

Object of the study

- patients registered in polyclinic institutions in Almaty (8 polyclinics);
- patient satisfaction with the quality and accessibility of primary health care during the COVID-19 pandemic.

Subject of the study

The quality and accessibility of primary health care during the COVID-19 pandemic, as well as medical, social, organizational, and communication factors influencing patient satisfaction, including accessibility of services, continuity of

care, use of telemedicine technologies, and effectiveness of health care delivery in epidemic conditions.

Description of the Main Research Results

As a result of the study, new evidence-based data describing the quality and accessibility of primary health care during the COVID-19 pandemic were obtained.

1. Organizational, human resource, and system-related constraints were identified, as well as behavioral and social factors on the patient side, including fear of seeking medical care, reduced healthcare utilization among patients with chronic diseases, and disruption of regular follow-up. The findings highlight the need to further strengthen primary health care (PHC) and enhance its resilience to emergency situations.

2. In 2020, only 19.4% of dispensary patients underwent preventive examinations, which can be explained by restrictions related to the COVID-19 pandemic. In 2021, this proportion increased to 27.5%. Three main reasons were identified: pandemic-related restrictions (primary reason), lack of awareness regarding the need for preventive examinations, and changes in patient registration (place of attachment).

The main reasons for dissatisfaction among patients who had COVID-19 (n=453) were the inattentive attitude of physicians and long waiting times for medical care. In addition, approximately 36% reported other reasons, including difficulties in accessing diagnostic examinations, cancellation of routine check-ups, and quarantine-related restrictions.

Digital health technologies, such as online appointment systems via medical organization websites or government service portals, remain underutilized, with only 2.6% of respondents selecting this method of appointment booking with a general practitioner.

Among 1035 respondents who assessed the quality of PHC during the pandemic, 74.8% (n=774) rated it as satisfactory. Among 1,008 respondents who assessed accessibility, approximately 70% reported satisfaction to varying degrees. Overall, more than 60% of respondents rated the national healthcare system as “good” or “satisfactory”. However, several issues require further investigation. Approximately 24% of patients who had COVID-19 reported self-medication, possibly due to fear of isolation and lack of trust in healthcare providers. Nearly half of respondents who received telephone consultations were not satisfied with their quality.

Only 2.6% of respondents used online appointment systems with a general practitioner, highlighting the need for further development of digital health technologies. The high demand for home-based medical care during the pandemic also indicates the need to strengthen and further develop mobile healthcare teams.

The assessment of outpatient care quality was statistically significantly associated with age, marital status, education level, presence of chronic diseases, and history of COVID-19 infection. Respondents aged 50 years and older were more likely to rate care quality as unsatisfactory compared to younger individuals.

Respondents with higher or secondary specialized education, as well as married individuals and those with chronic diseases or a history of COVID-19, were more likely to report dissatisfaction.

The analysis further showed that although the assessment of care quality was significantly associated with sociodemographic and clinical factors, the strongest predictors were education level and history of COVID-19 infection. Specifically, higher education and previous COVID-19 infection were associated with a lower likelihood of giving a satisfactory evaluation of primary health care services.

From the perspective of epidemiological control, implementation of infection prevention and control measures in PHC organizations, including isolation procedures, use of personal protective equipment, and COVID-19 testing, was assessed. Overall, 72% of respondents rated the sanitary and hygienic conditions of their polyclinics as good or satisfactory, while 28% rated them as poor or unsatisfactory.

3.Based on focus group findings, it was determined that during the COVID-19 pandemic, the quality and accessibility of PHC were influenced by a combination of interrelated factors, including the transition to remote care delivery, restrictions in outpatient facilities, a shift in focus from preventive services to acute care, shortages of personal protective equipment, and increased levels of anxiety and fear among both patients and healthcare professionals.

4. Based on the results of the comprehensive study, a system of practical recommendations aimed at improving the efficiency of the primary healthcare (PHC) system during public health emergencies and epidemic situations was developed. The dissertation proposes an algorithm for organizing PHC activities during a pandemic, including a stepwise assessment of PHC organizations' preparedness for epidemiological challenges, as well as stratification of patient flows according to urgency level and clinical condition, with separate identification of patients with chronic diseases, scheduled visits, and face-to-face consultations. The proposed algorithm предусматривает the implementation and adaptation of telemedicine technologies through the integration of telemedicine protocols into medical information systems, the establishment of digital support zones, and training of healthcare personnel. An important component of the model is the implementation of remote monitoring, including online consultations, therapy adjustment, home-based patient follow-up, and an automated feedback system. The final stage of the algorithm involves quality control and effectiveness assessment, including monitoring patient satisfaction, comparative analysis of the quality indicators of remote healthcare services, and evaluation of the effectiveness of telemedicine protocols. The developed system has a cyclical structure and provides for a return to previous stages when organizational or clinical deficiencies are identified.

Scientific Novelty

A scientifically grounded assessment of the quality and accessibility of primary health care during the COVID-19 pandemic was conducted in relation to public satisfaction with the quality of medical services. The factors influencing the

quality and accessibility of primary health care in epidemic conditions were identified. A comparative analysis of the level of patient satisfaction with medical care among patients with and without chronic diseases who had COVID-19 was carried out. An assessment of primary care functioning under conditions of system overload, involving the integration of medical, digital, and organizational resources, was performed. Changes in patient doctor–patient communication (deontology) and treatment adherence during the mass transition to remote forms of consultation were also analyzed.

The Main Provisions Submitted for Defense

1. COVID-19 has affected all components of the global health system. The priorities of primary health care (PHC) organizations shifted from routine medical services to anti-epidemic measures. The accessibility of primary health care during the pandemic was characterized by reduced continuity of follow-up for patients with chronic diseases, an increased proportion of delayed diagnoses, and late referrals.

2. The most significant predictors of perceived quality of medical care were education level and history of COVID-19 infection. Elderly patients and individuals with chronic diseases were identified as the most vulnerable groups during the pandemic.

3. Telemedicine could not fully replace face-to-face consultations. Approximately half of the respondents were not satisfied with the quality of online consultations, and only two-thirds of those in need received the full scope of required care.

4. The key factors contributing to the deterioration of primary health care quality included shortages of personal protective equipment, increased workload among healthcare professionals, a shift in focus toward acute conditions, and reduced preventive activities. Accessibility was particularly affected among elderly patients and individuals with chronic diseases.

Practical Significance

The results of this study provide valuable insights for the primary health care (PHC) system based on lessons learned during the COVID-19 pandemic. Organizational measures have been developed for practical healthcare to improve the quality and accessibility of PHC in epidemic conditions.

The findings of the assessment may contribute to the improvement of the activities of primary health care organizations serving registered populations and support the development of evidence-based interventions applicable in epidemic settings. Recommendations are provided for the implementation of telemedicine technologies in PHC practice, which have demonstrated effectiveness in reducing the burden on face-to-face consultations without compromising diagnostic quality.

Personal Contribution of the Doctoral Student

The author’s personal contribution consists of direct participation at all stages of the research, including the development of the theoretical and methodological framework of the study, adaptation of an international questionnaire, formulation of the research aim and objectives, organization and implementation of the study,

statistical data analysis, preparation of dissertation chapters, conduct of focus group discussions, interpretation and discussion of results, formulation of the provisions submitted for defense, as well as development of conclusions and practical recommendations.

Conclusions

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

1. According to the literature review, countries that demonstrated the most effective response to the COVID-19 pandemic included China, South Korea, Singapore, and the Scandinavian countries (Denmark, Norway, Finland), which showed particularly strong performance during the first wave of the pandemic. The key factor of effectiveness was a rapid and well-coordinated response to the outbreak. The acquired national experience in combating COVID-19 highlights the need to further develop flexible models of health service delivery and to strengthen the preparedness of the healthcare system for epidemiological challenges.

2. Overall, the performance of primary health care (PHC) organizations in Almaty can be considered satisfactory. More than 70% of respondents reported being “satisfied” or “rather satisfied” rather than “not satisfied” or “not fully satisfied.” More than 60% of respondents rated the national healthcare system as “good” or “satisfactory.” In addition, 71.7% of respondents in need of medical care were able to see a physician on the same day or the following day after their initial visit.

3. The main factors affecting the effectiveness of PHC during the COVID-19 pandemic included insufficient preparedness for remote care delivery, reduced outpatient follow-up services, epidemiological restrictions, the psycho-emotional state of the population, and the presence of chronic diseases. In 2019, only 19.4% of patients underwent preventive examinations, while in 2021 this figure increased to 27.5%. The results of the qualitative study demonstrated that, in epidemic conditions, preventive activities were reduced, shortages of personal protective equipment were observed, and the workload of healthcare workers increased. The use of telemedicine and mobile medical teams partially mitigated these limitations; however, a comprehensive system-wide approach is required for full adaptation.

4. The developed set of recommendations aimed at improving the effectiveness of the PHC system in emergency epidemiological situations includes organizational, psychosocial, and managerial measures (implemented in two polyclinics in Almaty).

Approbation of the Work

The main results of the dissertation were presented at the following conferences:

1. “Modern Science Management and Standards of Scientific Research”, March 27, 2023, Prague (Czech Republic).

2. International Scientific and Practical Conference “Improvement of the Quality and Efficiency of Primary Health Care”, June 7, 2021, Tashkent (Uzbekistan).

The main scientific results and provisions of the thesis were also presented and discussed at an expanded meeting of the Scientific Committee on Public Health of the Kazakh National Medical University named after S.D. Asfendiyarov as part of the preliminary defense procedure. Following the discussion, the dissertation was recommended for defense at a meeting of the Dissertation Council (No. 11, May 13, 2026).

Publications

Four publications have been published on the topic of the dissertation, including:

I. Scientific publications in journals indexed in the Scopus database (1 article):

1. Shaki, D.; Aimbetova, G.; Baysugurova, V.; Kanushina, M.; Chegebayeva, A.; Arailym, M.; Merkibekov, E.; Karibayeva, I. Level of Patient Satisfaction with Quality of Primary Healthcare in Almaty During COVID-19 Pandemic. Int. J. Environ. Res. Public Health 2025, 22, 804. https://doi.org/10.3390/ijerph22050804

II. Publications in journals recommended by the Committee for Quality Assurance in Education and Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan (3 articles):

1. Aimbetova G.E., Baysugurova V.Yu., Kanushina M.A., Kashafutdinova G.T., Aymakhanova A.Sh., Shaki D.T. Telemedicine during the COVID-19 pandemic // Science and Healthcare. 2022. 4 (Vol. 24). P. 19–26. doi: 10.34689/SH.2022.24.4.003

2. D.T. Shaki, G.E. Aimbetova, V.Yu. Baysugurova, M.A. Kanushina, M.A. Ramazanova, Zh.A. Kozhekenova, A.E. Tursynbekova. Primary Health Care System during the COVID-19 Pandemic: Literature Review. *Pharmacy of Kazakhstan*. No. 6, 2022. P. 103–109. https://pharmkaz.kz/wp-content/uploads/2022/12/6_2022_2.pdf

3. E. Aimbetova, V.Yu. Baysugurova, M.A. Kanushina, D.T. Shaki, M.A. Ramazanova, A.E. Tursynbekova. Impact of the COVID-19 Pandemic on Patients with Chronic Diseases: Literature Review. *Pharmacy of Kazakhstan*. No. 6, 2022. P. 110–115. https://pharmkaz.kz/wp-content/uploads/2022/12/6_2022_2.pdf

The results of the study have been implemented in the activities of two primary health care organizations, as confirmed by implementation acts. During the course of the study, an original questionnaire was developed and used, for which a certificate of state registration of a copyright object (No. 71396) was obtained.

Scope and Structure of the Dissertation

The dissertation consists of an introduction, four chapters, a conclusion, findings, practical recommendations, and a list of references comprising 171 sources.

The main text of the dissertation is presented on 117 pages of typewritten text and includes 20 tables, 8 figures, and 4 appendices.

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