Original Article

Transformation of the medical care system in Kazakhstan: the role and potential of specialists with extended medical practice.

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ABSTRACT

Background

Kazakhstan's healthcare system faces significant challenges, including limited access to care in rural areas and a shortage of healthcare professionals. Advanced Practice Nurses (APNs), with their advanced education and clinical expertise, have been shown to improve healthcare access and quality worldwide, especially in underserved regions. Despite this potential, the role of APNs in Kazakhstan is underdeveloped.

Aim

This study aims to explore the perceptions, challenges, and opportunities surrounding the integration of APNs into Kazakhstan's healthcare system. It examines the barriers to adopting APN roles and investigates the potential impact of APNs on improving healthcare delivery, particularly in rural areas.

Methods

A qualitative design was used, involving semi-structured interviews with 15 participants, including nurses, healthcare administrators, and policymakers. Data were analyzed thematically to identify key barriers, perceptions, and opportunities related to the integration of APNs into the healthcare system. Findings will inform policy and provide recommendations for APN development in Kazakhstan.

Results

The study found a lack of awareness about APN roles, particularly in rural areas, with regulatory and educational barriers hindering their integration. Resistance from physicians and the absence of graduate-level nursing programs were key challenges. However, participants recognized the potential of APNs to improve healthcare access and outcomes, especially in underserved areas.

Conclusion

To successfully integrate APNs into Kazakhstan's healthcare system, clear regulatory frameworks, advanced nursing education, and stronger interprofessional collaboration are essential. These steps will help improve healthcare access and outcomes, particularly in rural areas.

Keywords

Advanced Practice Nurses (APNs); Kazakhstan healthcare system; healthcare access; nursing education; rural healthcare, interprofessional collaboration; regulatory challenges; healthcare reform; barriers to integration; chronic disease management

INTRODUCTION

Kazakhstan, a vast Central Asian nation with a population of over 19 million people, has undergone significant changes in its healthcare system in recent decades. The country's healthcare system, once burdened by inefficiencies and shortages of

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healthcare professionals, has seen improvements as part of the national reforms designed to address challenges related to health access, quality, and efficiency (World Health Organization [WHO], 2020). Despite notable advancements, however, the healthcare system continues to face considerable disparities, especially in rural and remote areas where access to specialized care remains limited and healthcare providers are scarce. This uneven distribution of healthcare resources has prompted Kazakhstan to explore innovative solutions, including the expansion of nursing roles, to ensure that the healthcare needs of its diverse population are met effectively. Among these innovations, the role of the Advanced Practice Nurse (APN) is emerging as a critical component of healthcare reform.

Advanced Practice Nurses, a category of nurses who possess advanced education, clinical training, and autonomy in clinical decision-making, have become integral to healthcare systems worldwide. They include roles such as Nurse Practitioners (NPs), Clinical Nurse Specialists (CNSs), Nurse Anesthetists (CRNAs), and Nurse Midwives (CNMs), each of whom performs tasks that traditionally required physicians or specialists (American Association of Nurse Practitioners [1]. The role of the APN has gained substantial recognition in countries such as the United States, Canada, and the United Kingdom, where these professionals are seen as crucial in providing high-quality, patient-centered care, improving access to healthcare, especially in underserved areas, and alleviating pressure on overburdened healthcare systems[2].

In Kazakhstan, nursing has long been seen as a supporting profession, mostly confined to routine care in hospitals and clinics. For many years, nurses have worked under difficult conditions — dealing with staff shortages, limited training opportunities, and little acknowledgement of the broader responsibilities nurses now take on in many parts of the world.

Recently, however, there has been a growing understanding that nursing — especially with the introduction of Advanced Practice Nurse (APN) roles — can help address major gaps in the national healthcare system[3]. This shift is slowly changing the way nurses are viewed and how their skills are used.

Considering Kazakhstan's specific healthcare needs, particularly in its rural and hard-to-reach areas, the inclusion of APNs could become a key step toward improving both the availability and the quality of medical services.

While the APN role holds immense potential, its development in Kazakhstan is still in its early stages. The integration of APNs into the Kazakhstani healthcare framework faces significant barriers, including regulatory uncertainty, limited advanced nursing education programs, and resistance from other healthcare professionals, particularly physicians. There is also a lack of clarity regarding the exact scope of practice for APNs, leading to confusion about their role in the healthcare system and limiting their potential impact. As a result, the widespread adoption of APNs in Kazakhstan remains an ongoing challenge, requiring deliberate efforts to create supportive policies, educational infrastructures, and interprofessional collaborations.

This article explores the evolving role of the Advanced Practice Nurse in Kazakhstan, with a particular focus on the barriers and opportunities associated with integrating this role into the healthcare system. It discusses the potential impact of APNs on healthcare delivery, especially in underserved and rural areas, and examines the need for changes in policy, education, and practice to fully realize the benefits of advanced practice nursing in the country. Drawing on global examples and the emerging trends within Kazakhstan, this article aims to offer a comprehensive understanding of how the APN role can be developed and implemented to address key healthcare challenges.

The importance of this exploration lies in the potential for APNs to contribute significantly to the improvement of Kazakhstan's healthcare system, which continues to face challenges such as physician shortages, inadequate access to care in remote areas, and the rising burden of non-communicable diseases. By understanding the current state of nursing practice in Kazakhstan and identifying the structural changes necessary for the integration of APNs, this study seeks to inform policymakers, healthcare leaders, and educators about the potential for transforming nursing practice to meet the needs of a growing and diverse population. Ultimately, the integration of APNs could serve as a sustainable solution for enhancing healthcare access, improving health outcomes, and reducing healthcare disparities in Kazakhstan.

Purpose of the Study

The purpose of this qualitative study is to explore and understand the emerging role of Advanced Practice Nurses (APNs) in Kazakhstan's healthcare system. Despite global recognition of APNs' potential to enhance

healthcare delivery, especially in underserved and rural regions, the role of APNs remains underdeveloped in Kazakhstan. This study aims to investigate the perceptions, challenges, and opportunities surrounding the integration of APNs into the healthcare system. By examining the perspectives of healthcare professionals, administrators, policymakers, and nurses, this research seeks to identify barriers to the establishment of APN roles, the level of awareness and acceptance of these roles within the healthcare system, and the potential impact of APNs on improving access to quality care, particularly in rural areas. The findings aim to inform healthcare policy and provide recommendations for the future development of APN roles in Kazakhstan, supporting healthcare reform efforts.

Data Collection

Data for this study were collected through semi-structured interviews, which were chosen to allow for in-depth exploration of participants' experiences, beliefs, and perceptions. Semi-structured interviews are particularly well-suited to qualitative research as they provide flexibility for participants to express their views freely while ensuring that key areas of interest are covered [4]. The interviews were guided by an interview protocol, which included open-ended questions focused on the following themes:

Perceptions of APN roles – What is your understanding of the role of Advanced Practice Nurses in healthcare?

Barriers to APN integration – What do you see as the primary challenges to implementing APN roles in Kazakhstan?

Educational and regulatory frameworks – How do you perceive the current state of nursing education and regulation in Kazakhstan for APNs?

Potential benefits and impact – How do you believe the integration of APNs could improve healthcare outcomes in Kazakhstan, particularly in rural areas?

The interviews were conducted in Kazakh and Russian, as these are the primary languages spoken by healthcare professionals in Kazakhstan. Participants were given the option to select their preferred language for the interview, ensuring that they felt comfortable and able to express themselves fully. The interviews were audio-recorded, transcribed verbatim, and analyzed thematically to identify patterns and insights.

Participants

The study involved 15 participants, selected through purposive sampling to ensure that individuals with direct knowledge or experience related to the role of nurses in Kazakhstan's healthcare system were included. The participants were divided into three groups:

1. Nurses (5 participants) – Nurses working in both urban and rural settings, including those with experience in clinical, managerial, and teaching roles. These participants were selected to provide insights into the current state of nursing practice and their views on the potential for advanced practice roles.

2. Healthcare Administrators (5 participants) – Individuals responsible for managing healthcare facilities and shaping healthcare policy. They were included to gain a perspective on the organizational and policy-related challenges and opportunities for implementing APN roles.

3. Policymakers (5 participants) – Government officials or individuals involved in healthcare policy formulation and healthcare system reforms. These participants provided an understanding of the legislative and regulatory frameworks governing healthcare practice in Kazakhstan and their role in shaping the future of nursing roles.

Participants were recruited through formal invitations sent by email and phone calls to healthcare institutions, universities, and government agencies involved in health policy and nursing education. The study aimed to capture a diverse range of views and experiences, from those directly involved in patient care to those responsible for policy implementation at the national level.

Ethical Clearence

This study adhered to ethical guidelines that ensured the protection of participants' rights, privacy, and confidentiality throughout the research process. Several key ethical considerations were observed:

1. Informed Consent: All participants were provided with detailed information about the study's purpose, objectives, and data collection methods. They were informed about their right to withdraw from the study at any time without any consequences. Informed consent was obtained from all participants prior to conducting the interviews. The consent form emphasized the voluntary nature of participation and

ensured that participants understood the potential risks and benefits of participating in the study.

2. Confidentiality and Anonymity: All data collected from participants were kept confidential. Participants were assigned unique identifiers to ensure their anonymity, and any identifying information was removed from the interview transcripts. Audio recordings were stored securely and will be deleted after the study's completion. Data were analyzed in aggregate to prevent the identification of individual participants in the results.

3. Respect for Participants' Autonomy: The study respected participants' autonomy by ensuring that their participation was voluntary and that they had the opportunity to withdraw at any point during the study without consequence. Participants were encouraged to share their perspectives openly, and their views were considered valuable in contributing to the broader understanding of the role of APNs in Kazakhstan.

4. Minimizing Harm: The research was designed to minimize any potential harm to participants. There were no foreseeable risks associated with the study, as the interview topics focused on participants' professional experiences and opinions. Moreover, the study provided participants with the opportunity to reflect on their professional roles and contribute to the development of healthcare policies in Kazakhstan, which may ultimately benefit their field.

5. Cultural Sensitivity: Given the diverse cultural context of Kazakhstan, the researchers ensured that the study design and data collection methods were culturally sensitive. Interviews were conducted in both Kazakh and Russian, allowing participants to communicate in their preferred language, which helped establish rapport and encouraged participants to express themselves freely.

Ethical clearence: This study was conducted in accordance with ethical standards. Ethical approval was obtained from the appropriate institutional review board, and informed consent was secured from all participants prior to data collection.

RESULTS

The data collected from the interviews were analyzed using thematic analysis, which is an inductive method that allows researchers to identify, analyze, and report patterns (themes) within qualitative data [5]. The thematic analysis revealed several key findings, organized into the following themes:

1. Awareness and Understanding of APN Roles: There was a general lack of understanding of the APN role among healthcare professionals, particularly in rural areas. Many participants expressed uncertainty about the specific responsibilities of APNs and how they would fit into the existing healthcare workforce. While some recognized the potential for APNs to improve healthcare delivery, particularly in rural settings, others expressed concerns about the scope of their practice and whether they would face resistance from physicians.

2. Barriers to Integration: Several barriers to the integration of APNs were identified, including regulatory challenges, a lack of formalized education programs, and resistance from physicians. Healthcare administrators and policymakers emphasized that the current regulatory framework for nursing in Kazakhstan does not adequately support the expansion of nursing roles, particularly advanced practice roles. The absence of clear legal definitions for APNs and a lack of national standards for APN education were seen as significant obstacles.

3. Educational Gaps: A key finding from the study was the need for improved educational opportunities for nurses who wish to pursue advanced practice roles. Participants highlighted the absence of graduate-level nursing programs, particularly those focused on clinical practice and specialization. Nurses expressed a desire for more formalized education and training to equip them with the skills required for advanced practice.

4. Interprofessional Collaboration: The potential for APNs to foster greater collaboration between nurses and physicians was identified as a benefit of integrating APNs into the healthcare system. However, the study also found that interprofessional collaboration could be hindered by existing hierarchies and power dynamics within healthcare teams. Some participants noted that physicians might resist the idea of sharing responsibilities with APNs, particularly in areas such as diagnosis and prescription.

5. Impact on Healthcare Access and Outcomes: Participants widely agreed that APNs could have a positive impact on healthcare access and outcomes, particularly in rural areas. The integration of APNs could help reduce the burden on physicians and improve access to primary care services, especially in regions where healthcare providers are scarce. Nurses in rural areas expressed strong support for the idea of APNs taking on expanded roles to help address the healthcare needs of local communities.

Table 1: Analysis of Key Findings and Themes from the Study on the Role of Advanced Practice Nurses (APNs) in Kazakhstan

Theme	Sub-themes/Findings	Analysis	Supporting Literature
1. Awareness and Understanding of APN Roles	Lack of awareness about APN roles	Healthcare professionals, especially in rural areas, showed limited understanding of APN roles and their scope of practice.	The lack of awareness may impede the integration of APNs into healthcare teams and limit their effectiveness.
	Uncertainty about scope of practice	Many participants expressed uncertainty regarding the roles APNs could play, such as diagnosing, prescribing, and team leadership.	Role ambiguity contributes to confusion, preventing full utilization of APNs' potential.
	Potential for APNs to improve rural healthcare access	Despite some confusion, many recognized the potential of APNs to improve healthcare delivery, particularly in rural areas.	APNs are seen as beneficial in improving care access where healthcare professionals are scarce.
2. Barriers to Integration	Regulatory challenges	The lack of clear legal definitions for APNs in Kazakhstan limits their scope of practice, such as prescribing or making diagnoses.	The regulatory framework in Kazakhstan does not support the expansion of advanced nursing roles.
	Lack of formalized education programs	There are no graduate-level nursing programs focused on preparing nurses for advanced practice roles.	The absence of advanced practice education programs limits the preparation of nurses for APN roles.
	Resistancefromphysicians	Physicians may resist sharing responsibilities, especially in diagnosing and prescribing, due to hierarchical structures.	Traditional hierarchies in healthcare can limit collaboration between physicians and nurses.
3. Educational Gaps	Lack of graduate-level education programs for APNs	Participants expressed a need for more formalized graduate-level education to support advanced practice roles.	Graduate programs are necessary to equip nurses with the clinical and leadership skills required for APN roles.
	Desireforspecializedtraining	Nurses showed strong interest in gaining specialized training in clinical practice and leadership to take on advanced roles.	There is a growing demand for education that prepares nurses for specialized, higher-level responsibilities.
4. Interprofessional Collaboration	Potential for improved collaboration between nurses and physicians	APNs could help foster better teamwork and improve patient care outcomes through collaboration between nurses and physicians.	Collaborative care models improve care quality and efficiency, making a strong case for APN integration.
	Barriers due to power dynamics	Hierarchical relationships between nurses and physicians may hinder effective collaboration and the sharing of responsibilities.	Power dynamics in healthcare can create barriers to interprofessional collaboration.
	Need for cultural shift in healthcare teamwork	Overcoming hierarchical barriers requires a cultural shift towards mutual respect, trust, and shared decision-making.	Creating a collaborative healthcare environment is essential for the successful integration of APNs.
5. Impact on Healthcare Access and Outcomes	Improved access to healthcare in rural areas	Participants widely agreed that APNs could improve healthcare access, particularly in rural areas with healthcare provider shortages.	APNs are recognized globally for their ability to provide primary care services, alleviating physician shortages.
	Impact on chronic disease management	APNs could take on roles in managing chronic diseases such as diabetes and hypertension, helping to reduce long-term healthcare burdens.	APNs are effective in chronic disease management, improving long-term health outcomes.
	Reductioninphysicianburden	APNs could reduce the workload of physicians, allowing them to focus on more complex cases while managing routine or preventive care.	APNs can assist in alleviating physician shortages, improving efficiency in healthcare delivery.

This table synthesizes the key findings from the study on the role of Advanced Practice Nurses (APNs) in Kazakhstan and provides a thematic analysis of the results, with an emphasis on the implications for healthcare delivery and integration. It categorizes the key findings into five primary themes: Awareness and Understanding of APN Roles, Barriers to Integration, Educational Gaps, Interprofessional Collaboration, and Impact on Healthcare Access and Outcomes.

Theme 1: Awareness and Understanding of APN Roles highlights the general lack of awareness of the APN role among healthcare professionals, especially in rural areas. This lack of clarity, along with concerns about the scope of APNs' responsibilities, poses challenges for their integration into healthcare teams.

Theme 2: Barriers to Integration identifies the regulatory and educational challenges facing the expansion of APN roles in Kazakhstan, including the absence of a clear legal definition for APNs and the lack of graduate-level nursing programs.

Theme 3: Educational Gaps emphasizes the importance of establishing formal educational pathways to train nurses for advanced practice roles. Nurses expressed strong support for graduate-level programs to equip them with the necessary skills for clinical practice and leadership.

Theme 4: Interprofessional Collaboration discusses the potential for APNs to improve collaboration between nurses and physicians, as well as the barriers posed by hierarchical power dynamics within healthcare teams.

Theme 5: Impact on Healthcare Access and Outcomes focuses on the potential positive impact of APNs in improving healthcare access, particularly in underserved rural areas, and in managing chronic diseases such as diabetes and hypertension, thus improving overall health outcomes.

The table also connects these findings to global literature, drawing on studies from other countries where APN roles have been integrated into healthcare systems. This comparison helps contextualize the findings within the broader international framework of advanced practice nursing. The supporting literature column reinforces the relevance of these findings and highlights the challenges and opportunities faced by Kazakhstan in integrating APNs into its healthcare system.

DISCUSSION

The findings of this qualitative study provide a comprehensive understanding of the evolving role of Advanced Practice Nurses (APNs) in Kazakhstan's healthcare system. The results underscore the potential for APNs to address critical healthcare challenges in the country, particularly in underserved and rural areas, but also highlight significant barriers that must be overcome for the effective integration of these roles. These challenges include limited awareness of APN roles, regulatory and educational gaps, interprofessional resistance, and a lack of clear policy direction. This discussion will reflect on the implications of these findings, explore the barriers identified, and offer recommendations for overcoming these challenges, drawing comparisons with global practices.

Lack of Awareness and Understanding of APN Roles

A prominent theme that emerged from the study was the widespread lack of awareness and understanding of APN roles among healthcare professionals in Kazakhstan. Many participants, particularly those in rural areas, expressed uncertainty about the specific responsibilities and scope of APNs, with some even questioning how their integration would affect existing roles in the healthcare system. This mirrors the experiences of other countries where advanced practice nursing roles have been slow to gain recognition due to limited understanding of their scope and potential impact[6]. In Kazakhstan, the traditional view of nursing as a subordinate role in the healthcare hierarchy, largely focused on basic care, stands in contrast to the expanded, autonomous responsibilities that APNs hold in other parts of the world[7]. The lack of clear, standardized definitions for APN roles leads to confusion among healthcare providers about what APNs can do and how they fit into the overall healthcare delivery structure. Therefore, increasing awareness through education and outreach efforts is crucial to ensure that healthcare professionals understand the value of APNs in improving care outcomes.

Barriers to Integration: Regulatory and Educational Challenges

The study also highlighted the significant barriers posed by the regulatory and educational frameworks in Kazakhstan. Participants noted the absence of a clear legal definition for APNs, which makes it difficult to establish the scope of their practice. This regulatory

gap limits the ability of APNs to perform tasks such as prescribing medications, making diagnoses, or leading clinical teams—functions that are crucial for their role in healthcare systems worldwide [8]. This issue aligns with the findings of other studies, which have identified the need for a well-defined regulatory framework to support the expansion of nursing roles[9]. Without clear guidelines and formal recognition of their authority, APNs may face challenges in practicing at the full extent of their training and expertise, limiting their potential to improve healthcare delivery.

Additionally, the lack of educational opportunities for advanced practice nursing is a significant barrier. While Kazakhstan has made strides in improving nursing education at the undergraduate level, there are few graduate programs designed to train nurses for advanced practice roles. This gap in nursing education was identified as a major obstacle to the development of an advanced practice nursing workforce in the country. Globally, advanced nursing education is seen as a fundamental prerequisite for the successful integration of APNs[10], and its absence in Kazakhstan hampers the ability to prepare nurses for the complex and specialized tasks that APNs undertake. The lack of graduate programs also means that the pipeline of qualified nurses for APN roles is limited, further exacerbating the shortage of skilled healthcare providers. Establishing graduate-level nursing programs and creating pathways for nurses to pursue advanced practice training will be essential for the growth of this role in Kazakhstan.

Interprofessional Collaboration and Resistance from Physicians

A critical barrier identified by participants was the potential resistance from physicians, particularly regarding the sharing of clinical responsibilities and decision-making authority with APNs. Several healthcare administrators and nurses expressed concerns that physicians might be reluctant to collaborate with APNs, especially in clinical tasks traditionally within physicians' purview, such as diagnosis and treatment planning. This resistance is not unique to Kazakhstan but has been a common challenge in many countries where APNs are emerging as a solution to physician shortages [11]. Hierarchical structures in healthcare, where physicians hold exclusive authority over clinical decision-making, can contribute to these tensions and inhibit the development of collaborative practices [12].

However, studies have shown that interprofessional collaboration can be fostered through education and clear role delineation, which help mitigate resistance from physicians[13]. In Kazakhstan, efforts to integrate APNs into healthcare teams will need to focus on building mutual respect and trust between nurses and physicians. Developing collaborative care models, where both professionals recognize each other's contributions, will be vital for overcoming resistance and improving healthcare outcomes. Additionally, policy reforms that clarify the roles of APNs and highlight the value they bring to the healthcare team could help ease the acceptance of APNs among physicians.

Potential Impact of APNs on Healthcare Access and Outcomes

Despite the challenges, the potential benefits of integrating Advanced Practice Nurses (APNs) into Kazakhstan's healthcare system are widely acknowledged. Participants in the study, particularly those from rural and remote areas, expressed optimism about the role APNs could play in improving access to healthcare. Kazakhstan, like many countries, faces a significant shortage of healthcare providers, especially in rural regions, where long distances and limited resources hinder access to care (World Health Organization [WHO], [14]. APNs, with their ability to deliver primary care services, manage chronic diseases, and provide preventive care, could alleviate the pressure on physicians and help bridge the gap in healthcare access. Evidence from other countries supports this, demonstrating that APNs can deliver high-quality, cost-effective, and patient-centered care[15].

One of the most pressing healthcare challenges in Kazakhstan is the growing burden of non-communicable diseases (NCDs), such as hypertension and diabetes, which are particularly prevalent in rural and remote areas. Studies have shown that metabolic syndrome and its components are widespread in southern Kazakhstan, underscoring the urgent need for effective chronic disease management strategies [16]. APNs could play a pivotal role in addressing this issue by taking on responsibilities in chronic disease management and prevention, thereby reducing the long-term healthcare burden and improving overall health outcomes. Global evidence consistently highlights the effectiveness of APNs in managing chronic conditions and enhancing patient outcomes, especially in underserved regions [17].

The impact of cardiovascular diseases and comorbidities

on mortality in Kazakhstan, particularly in underserved areas, further emphasizes the need for integrated care models. A 12-year follow-up study in southern Kazakhstan revealed the significant influence of comorbidities on overall and cardiovascular mortality, highlighting the importance of addressing multiple health conditions simultaneously [18]. Socio-demographic factors, such as income and education, also play a critical role in shaping health outcomes. For example, a study in Turkestan, southern Kazakhstan, found a high prevalence of anemia linked to metabolic syndrome, pointing to the need for targeted interventions[19].

Innovative solutions, such as mobile healthcare technologies, could complement the role of APNs by enabling remote monitoring and patient education, particularly in rural areas [20]. Preventive care, especially for children, is another area where APNs could make a significant impact. A study on the physical development of first graders in southern Kazakhstan highlighted the importance of early interventions and standardized health assessments[21].

The quality of care for patients with chronic conditions, such as cancer, remains a challenge in Kazakhstan. A study evaluating oncological care in southern Kazakhstan identified gaps in outpatient services that could be addressed through the integration of APNs[22]. The COVID-19 pandemic has further exacerbated these challenges, particularly in managing comorbid conditions. A review of liver manifestations associated with COVID-19 underscored the need for integrated care models that address both acute and chronic health issues 23.

Complex conditions, such as thrombosis, require specialized care and interprofessional collaboration. A recent consensus paper emphasized the importance of advanced practice roles in managing coagulation disorders and improving patient outcomes [24]. The pandemic has also led to a significant rise in cardiovascular diseases in both rural and urban areas of Kazakhstan, necessitating targeted interventions to address this growing burden [25].

A personalized approach to managing chronic conditions, such as terminal renal failure, is essential for improving patient outcomes. A recent study in Kazakhstan highlighted the importance of tailored care plans and patient-centered approaches [26]. Additionally, risk factors for cardiovascular diseases,

such as obesity, are prevalent in Kazakhstan. A study comparing clinical and anthropometric parameters in overweight individuals emphasized the need for targeted interventions to reduce cardiovascular risk. Educational interventions have also proven effective in improving medication adherence among patients with chronic conditions, such as glaucoma, as demonstrated by a recent study in Kazakhstan [27].

In conclusion, integrating APNs into Kazakhstan's healthcare system has the potential to not only improve access to care but also enhance health outcomes, particularly for populations in rural and remote areas. By addressing the shortage of healthcare providers, managing chronic diseases, and leveraging innovative solutions, APNs could play a transformative role in the country's healthcare landscape.

Implications for Policy and Practice

The findings of this study point to several key recommendations for the development of APN roles in Kazakhstan. First, a clear regulatory framework for APNs is essential. This framework should define the scope of practice, licensure requirements, and legal responsibilities of APNs, enabling them to practice to the full extent of their training and expertise. Legal recognition of APNs will also help clarify their role in interdisciplinary teams, ensuring that their contributions are understood and respected by other healthcare professionals.

Second, Kazakhstan must invest in graduate-level nursing education programs to equip nurses with the specialized skills and knowledge needed for advanced practice roles. These programs should focus on clinical expertise, leadership, and healthcare management to prepare nurses for the complex tasks associated with APN roles. Collaboration between nursing schools, healthcare institutions, and policymakers will be crucial to developing these educational pathways.

Finally, fostering interprofessional collaboration will be vital for the successful integration of APNs into Kazakhstan's healthcare system. Training programs for both nurses and physicians should emphasize the value of collaboration and help build mutual respect between the two professions. By creating a culture of teamwork, Kazakhstan can ensure that APNs are able to work effectively alongside physicians and other healthcare professionals to improve patient care.

CONCLUSION

The results of this study provide valuable insights into the perceptions, challenges, and opportunities surrounding the integration of Advanced Practice Nurses into Kazakhstan's healthcare system. Despite the potential benefits of APNs, including improved access to care and reduced healthcare disparities, significant barriers remain, particularly in the areas of education, regulation, and interprofessional collaboration. The findings suggest that a structured approach to developing APN roles, including the establishment of clear regulatory frameworks and advanced training programs, is essential to fully realize the potential of APNs in Kazakhstan.

This study highlights the potential of Advanced Practice Nurses to transform healthcare delivery in Kazakhstan, particularly in rural and underserved regions. However, significant barriers, including regulatory ambiguity, educational gaps, and interprofessional resistance, must be addressed to realize the full potential of these roles. By developing clear regulatory frameworks, investing in nursing education, and promoting interprofessional collaboration, Kazakhstan can lay the groundwork for the successful integration of APNs into its healthcare system. The adoption of advanced practice nursing in Kazakhstan has the potential to improve access to care, enhance healthcare outcomes, and reduce the strain on an already overburdened healthcare system.

Authors's contribution:

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