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Perspectives of healthcare practitioners on environmental sustainability in healthcare: A qualitative study

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Abstract

Aim: To explore the perspectives of Kazakhstani healthcare professionals on environmental sustainability in healthcare.

Design: An exploratory qualitative design.

Methods: Four focus group discussions (FGDs) on environmental sustainability in healthcare were conducted among healthcare professionals (nurses, physicians, midwives and physical therapists) from June to August 2023 in three cities of Kazakhstan. Each FGD consisted of at least 6 to 11 participants and lasted between 60 and 90 minutes. The collected data were analysed using the thematic analysis.

Results: A total of 137 initial codes were identified and further organized into 22 subthemes based on similarities in codes and meanings, and then 5 significant themes were identified. The five main themes are 'Environmental Sustainability Practices in Healthcare', 'Purposes of Environmental Sustainability in Healthcare', 'Impact of Environmental Sustainability in Healthcare in Patients', 'Challenges in Implementing Environmental Sustainability in Healthcare' and 'The Role of Healthcare Leadership in Improving Environmental Sustainability in Healthcare'.

Conclusions: The findings highlighted the perceptions and practices of healthcare professionals on environmental sustainability's purposes in healthcare, its impacts on patients and its implementation challenges. The study also underscored the critical role of strong and active leadership in ensuring a sustainable implementation of green policies in healthcare facilities and achieving successful results of environmentally conscious healthcare practices.

Implications for the Profession and/or Patient Care: The findings provide invaluable information that can be used by policymakers and healthcare organization leaders to create a sustainable healthcare system. Implementing environmental sustainability practices in healthcare should be widespread, intentional, and sustainable, entailing strong leadership and unwavering personal and organizational commitment.

Patient or Public Contribution: No patient or public contribution.

Reporting Method: We adhered to relevant EQUATOR guidelines, specifically the Consolidated Criteria for Reporting Qualitative Research.

Jonas Preposi Cruz and Ejercito Mangawa Balay-Odao are co-first authors.

KEYWORDS
environmental health, environmental sustainability, health personnel, Kazakhstan, nurses, qualitative research

1 | INTRODUCTION

Rapid climate change has continuously posed an undeniable health threat to society (Dunphy, 2014; Lister et al., 2022). Considered the primary global health threat in the 21st century (Sherman et al., 2019), climate change is expected to contribute to an additional 250,000 annual deaths due to various health risks such as malnutrition, infections and extreme temperatures, especially in highly vulnerable areas with a weak health system (WHO, 2023). Given that almost 3.6 billion people live in areas prone to the effects of human-induced climate change (WHO, 2023), a proactive and immediate response should be in place to combat threats. The ramifications of climate change on humanity's overall health and well-being require healthcare professionals to actively address these environmental degradation issues immediately (Dunphy, 2014; Lister et al., 2022; Schwerdtle et al., 2020). This engagement includes incorporating the ideals and concepts of environmental sustainability into healthcare professionals' knowledge, attitude and practice (Cruz, Alshammari, & Felicilda-Reynaldo, 2018) and placing this as their core responsibility (Dunphy, 2014).

While 'First, do no harm' remains the cardinal principle in healthcare service and practice (Eckelman & Sherman, 2016; WHO, 2023a), ironically, the healthcare system contributes significantly to environmental problems, resulting in unfavourable impacts on people's health and well-being (Eckelman & Sherman, 2016; Sherman et al., 2019). Around 4% to 5% of greenhouse gas emissions worldwide come primarily from healthcare systems (Rodríguez-Jiménez et al., 2023), as most healthcare facilities require 24/7 operation and reliance on energy consumption. In the United States, the healthcare system contributes significantly to pollution, with at least 9%–10% of greenhouse gas (GHG) emissions coming from health-related facilities and processes (Eckelman & Sherman, 2016). In Kazakhstan, an obvious dependence of average annual temperature and precipitation changes on total GHG emissions was identified (Zhumadilova et al., 2023) causing floods and bushfires. The industrial activity in Kazakhstan, particularly the electric power industry and agriculture, contributes to GHG emissions due to the high depreciation of fixed assets, high energy intensity of production and inefficient use of agricultural areas (Smagulova et al., 2017). Energy consumption significantly influences CO_2 emissions in the country, but all factors, like urbanization, energy consumption and energy pricing, have an equal impact on gross domestic product (Tleppayev & Zeinolla, 2023). Also, it was noted that more than 58% of whole GHG emissions in Kazakhstan were accounted for from coal (Wang et al., 2019). Given the adverse effects caused by climate change through GHG emissions, there is an urgent need for healthcare professionals to reassess the healthcare system and strengthen personal and institutional accountability.

As a member of the United Nations, Kazakhstan, an upper-middle-income country with a population of around 20 million people (as of 1 April 2024; United Nations [UN], 2024), has put great effort into advancing the healthcare system to make it more sustainable. The UN Development Program (UNDP), in collaboration with the Asian Development Bank (ADB), generously supported Kazakhstan's healthcare system during the escalation of the pandemic by organizing initiatives that aimed to establish a strong framework for sustainable management of medical waste even after the pandemic (UNDP, 2021). This initiative also includes training healthcare workers on proper waste disposal and even providing medications for treating some diseases (UNDP, 2021), which were considered essential parts of the country's effort to make the healthcare system more sustainable. However, despite such initiatives and increasing awareness, the shortage of qualified healthcare professionals (Balay-odao et al., 2024) is a challenge in advancing the country's efforts towards sustainable healthcare. With the increasing number of patients affected by the adverse effects of climate change, it is necessary to implement environmental sustainability in the healthcare system far beyond conventional approaches (Schwerdtle et al., 2020). This further signifies the importance of equipping their knowledge and skills and continually upgrading the competencies of healthcare professionals necessary to respond to the harmful effects of climate change.

1.1 | Background of the study

As the healthcare industry adapts to the ideals and practices of environmental sustainability, the cooperation of various stakeholders plays a pivotal role in making the healthcare system sustainable, improving the healthcare system and minimizing operational waste (Kinney, 2010; WHO, 2017). Stakeholders, such as healthcare professionals, must be aware of climate change's negative impacts and practice healthcare sustainability (Schwerdtle et al., 2020). Recognizing the adverse health and social effects brought by climate change is essential for healthcare professionals to properly address with urgency the ever-increasing challenges in the healthcare system (Lister et al., 2022).

To address these negative impacts of climate change, the World Health Organization (WHO, 2021) noted four action points calling on the healthcare community to (1) train the health workforce to respond to climate change, (2) take climate action in the healthcare sector, (3) enable the advocacy of health professionals on climate change and health and (4) protect the health of future generations. These action points urge healthcare professionals to continuously develop and transform their climate-neutral and sustainable

healthcare systems (WHO, 2021). As a response, new approaches to conventional healthcare practices and the formulation of sustainable policies, guidelines and educational programmes, among others, were in place to continuously educate and equip healthcare professionals about environmental sustainability (Lister et al., 2022).

The values, identities and attitudes of healthcare professionals about healthcare practices, including environmental sustainability, are shaped by the education and training received over the years (Balay-odao et al., 2024). Although this may refer to their formative years, their professional development, practices and experiences as part of the healthcare workforce also contribute to their perceptions on various issues such as ecological health practices. It has been observed that some health professionals implement environmental sustainability measures in their personal lives, rather than in their professional lives. This may imply that these actions are determined by values and the challenges they face in their personal lives (Dunphy, 2014). Healthcare professionals sometimes struggle to make environmentally responsible choices at work due to pressures and limitations they face on the job and a workplace culture that does not prioritize environmental sustainability practices (Dunphy, 2014). Despite such differences between their personal and professional responses on issues related to environmental sustainability in general, their perspectives on pressing issues related to climate change and its adverse effects on the healthcare system were shaped by their knowledge, attitudes and practices, which further helps in crafting relevant suggestions and actionable steps to develop a sustainable healthcare system (Lister et al., 2022). Given the negative impact of climate change on the healthcare system and the strong call for health professionals to proactively participate in reducing its impacts globally, this study explored the perspectives of Kazakhstani health professionals on environmental sustainability in healthcare.

1.2 | Aim

This study explored the perspectives of Kazakhstani healthcare practitioners on environmental sustainability in healthcare.

2 | METHODS

This study utilized the exploratory qualitative design among healthcare professionals in three regions in Kazakhstan. The study followed the 'Consolidated criteria for reporting qualitative research' (COREQ) (Tong et al., 2007).

2.1 | Settings and participants

The study was conducted in three hospitals in three different cities in Kazakhstan. The first hospital is a university hospital located in Astana City and has a capacity of 856 inpatient beds and 500

Impact

What problem did the study address?

- Although 'First, do no harm' remains the cardinal principle in healthcare service and practice, ironically, the healthcare system contributes significantly to environmental problems that negatively impact people's health and well-being.
- Given climate change's negative impact on the healthcare system and the strong call for health professionals to proactively participate in reducing its impacts globally, this study explored the perspectives of Kazakhstani health professionals on environmental sustainability in healthcare.

What were the main findings?

- The exploration of the perceptions of Kazakhstani healthcare professionals about environmental sustainability in healthcare revealed that healthcare workers have a wide range of sustainability initiatives, collectively called sustainable practices, to reduce the ecological impact of healthcare activities while promoting the adoption of sustainable practices. The environmental sustainability practices of healthcare professionals play a vital role in promoting risk reduction for patients and supporting initiatives that promote sustainable funding. Hospitals have environmentally friendly initiatives such as patient involvement, which can boost self-esteem and confidence in the patient and enhance recovery and rehabilitation. Healthcare workers acknowledge that governments, healthcare providers and other stakeholders must engage in innovative interactions to promote sustainable healthcare practices. Thus, organizations must have strong leadership and active participation to achieve long-term success and environmentally sustainable practices.

Where and on whom will the research have an impact?

- Policymakers in healthcare organizations can use the study findings to develop policies to ensure widespread, intentional and sustainable implementation of environmental sustainability practices in healthcare. The findings also call for healthcare organizations to consider leadership that prioritizes and values environmental conservation, promotes and supports teamwork and values lifelong learning. At a personal level, the findings urge healthcare professionals to develop a positive attitude towards the environment and environmentally conscious healthcare practices and to participate actively in green practices, advocating environmental conservation and green practices in healthcare.

outpatient visits per shift. The hospital has three main centres: the diagnostic centre, the mother and child centre and the heart centre. The second hospital is a multi-speciality hospital situated in Shymkent City. This hospital has an 800-bed capacity, providing consultation, diagnostic, surgical and therapeutic services in the Turkistan region. The third hospital, with an 80-bed capacity, is an occupational health clinic in Karaganda City. The hospital provides diagnostic services and outpatient and medical care to the population of Karaganda and neighbouring areas.

Approximately 1579 (men = 18.6%, women = 81.4%), 1500 (men = 11.4%, women = 88.6%) and 93 (men = 3.2%, women = 96.8%) healthcare professionals were working in the first, second and third hospitals respectively. Using purposive sampling, 36 participants were recruited according to the inclusion criteria of working full-time as a health professional, being a Kazakh national and being willing to participate in the study. The researcher in each participating city conducted face-to-face recruitment in a selected hospital. The researchers approached selected participants and explained the research's purpose, objective and process. After the participants agreed to participate in the study, written consent was obtained and a focus group discussion (FGD) schedule was developed based on the availability of all participants.

2.2 | Data collection

Data were collected from June to August 2023, and several follow-ups were carried out towards the end of 2023. Four FGDs were organized. Each FGD consists of at least 6–11 participants, ranging from 60 to 90 minutes (see Table 1).

Guide questions were used to explore the perspectives of Kazakhstani healthcare practitioners on environmental sustainability in healthcare. A forward–backward approach was taken to translate the protocol and then piloted. During the pilot test, a meeting was held with the researchers responsible for data collection to discuss and reflect on their experiences. Discrepancies were discussed and resolved by consensus, considering the interviews were conducted in parallel in three regions. This quality check during the pilot testing ensured that data collection was similar in all three regions. Eventually, no significant changes were made to the interview questions after the pilot and the interview protocol was similar in the three regions.

Subsequently, researchers from each region facilitated the logistics of the study and the recruitment of participants to obtain their consent. Then, the researchers facilitated the FGD using the agreed schedule and venue. The FGD began by introducing the topic and establishing a relationship. The researchers emphasized the rights, roles and consent of the participants. The participants' demographic data were then asked, followed by the core questions. The guide questions used in the FGDs are presented in Table 2. Each participant was given ample time to express their perspective. The researcher utilized probe questions to dig deeper into their answer. In parallel, the researchers created field notes during the FGD process immersed in the participant's context. All interviews were recorded. Before analysis, the transcripts were sent back to the participants to confirm their content. None of the participants made any changes to the content of the transcript.

2.3 | Data analysis

The collected data were analysed using a thematic analysis (Braun & Clarke, 2022). Data saturation was achieved per FGD when all participants agreed with each idea and did not share further information. Three researchers analysed the data, which were cross-checked or supplemented by the other researchers.

After the interview, the audio recordings were transcribed verbatim. Data were translated into English using forward translation employing dynamic equivalence and reviewed by external translators. The backward translation was impossible because the participants used a mixture of Kazakh and Russian languages in their answers. After the translation, a trilingual Kazakhstani reviewed the translations, focusing on understandability and naturalness.

The researchers immersed themselves by reading the transcript and their field notes repeatedly. As the process continued, the researchers highlighted the meaningful texts and created codes. The codes were then grouped accordingly to create sub-themes. In between the initial analysis, team members conducted a quality check with the analysis. Discrepancies were discussed by consensus. Additional meetings were conducted with the entire research team to discuss further and reflect on the sub-themes. Moreover, the analysis continued to develop the themes. Each theme was substantiated with a description. Then, another meeting was held to confirm the analysis.

2.4 | Ethics

This study was part of a research protocol approved by the Nazarbayev University Institutional Research Ethics Committee (IREC number: 636/31102022) on 21 November 2022. Similarly, permission from participating institutions was obtained. The participants signed an informed consent form and consented to the audio recording. The researchers ensured that participation in this study was voluntary. Data were kept and saved in a password-protected file on the primary investigator's computer.

2.5 | Rigour and reflexivity

The research team members vary in their educational background (nursing, medical doctor, public health, business and education) and experience in qualitative research. Each member kept a journal to track their preconceived ideas throughout the research process. This was then supplemented by debriefing, discussion and reflection during meetings.

TABLE 1 Profile of the participants.

Focus group	Participant	Gender	Age	Years of experience	Profession	Citizenship	Type of employment
1	1	Female	56	25	Nurse	Kazakh	Full time
	2	Female	59	22	Nurse	Kazakh	Full time
	3	Female	62	31	Nurse	Kazakh	Full time
	4	Female	60	35	Nurse	Kazakh	Full time
	5	Female	33	6	Physical Therapist	Kazakh	Full time
	6	Female	54	32	Nurse	Kazakh	Full time
	7	Female	57	35	Nurse	Kazakh	Full time
	8	Female	51	20	Physician	Kazakh	Full time
	9	Female	38	15	Nurse	Kazakh	Full time
2	10	Female	53	25	Physician	Kazakh	Full time
	11	Female	32	7	Nurse	Kazakh	Full time
	12	Female	30	5	Nurse	Kazakh	Full time
	13	Female	27	2	Nurse	Kazakh	Full time
	14	Male	29	4	Physician	Kazakh	Full time
	15	Female	56	31	Physician	Kazakh	Full time
	16	Female	25	1	Nurse	Kazakh	Full time
	17	Female	27	2	Nurse	Kazakh	Full time
	18	Female	44	19	Nurse	Kazakh	Full time
	19	Female	38	13	Nurse	Kazakh	Full time
3	20	Female	38	18	Nurse	Kazakh	Full time
	21	Female	27	7	Nurse	Kazakh	Full time
	22	Female	47	19	Midwife	Kazakh	Full time
	23	Female	23	2	Nurse	Kazakh	Full time
	24	Female	58	33	Physician	Kazakh	Full time
	25	Female	54	31	Physician	Kazakh	Full time
	26	Female	48	30	Nurse	Kazakh	Full time
	27	Female	28	1	Nurse	Kazakh	Full time
	28	Female	31	2	Nurse	Kazakh	Full time
	29	Female	50	30	Nurse	Kazakh	Full time
	30	Male	34	14	Nurse	Kazakh	Full time
4	31	Male	35	1	Nurse	Kazakh	Full time
	32	Female	45	20	Nurse	Kazakh	Full time
	33	Female	51	27	Nurse	Kazakh	Full time
	34	Female	27	7	Nurse	Kazakh	Full time
	35	Female	46	26	Nurse	Kazakh	Full time
	36	Female	57	34	Nurse	Kazakh	Full time

The study's rigour was ensured through several strategies (Baillie, 2015). The interview protocol was translated using conceptual equivalence, while dynamic equivalence was used to translate the participants' quotes. Then, confirmability was ensured by returning the transcript to the participants to confirm its content. Credibility was also ensured by spending time with the transcript to fully internalize the data, and this was also exhibited by spending time in the interview location to immerse ourselves in the context of the participants. Additionally, researcher triangulation was used by constant checks with analysis, discussion and reflection. Importantly, thick descriptions of the narratives of the participants were presented in the study results. The dependability was achieved by developing a detailed method used in the study and with the input of all the researchers. Transferability was established by providing a context for the study, including the setting and participants, and giving voice to various health professionals with their narrative extract.

TABLE 2 Guide questions used in the focused group discussions.

Guide questions
1. What does climate change mean to you? Can you explain?
2. Describe your understanding of the relationship between environment and health. Please explain your answer
3. What does environmental sustainability mean to you? Can you explain?
4. Describe the practices in your hospital that are environmentally friendly. Can you explain your practices?
5. What skills do you need to learn to practice environmental sustainability in healthcare? Please explain your answer
6. How important is environmental sustainability in your professional practice? Please explain your answer

3 | RESULTS

Of the 36 participants, 33 were women and 3 were men. The participants' ages ranged from 25 to 65, and their working experience ranged between 1 and 35 years (see Table 1). A total of 137 initial codes were identified and further organized into 22 sub-themes based on similarities in codes and meanings, and then 5 significant themes were identified. The five main themes are 'Environmental Sustainability Practices in Healthcare', 'Purposes of Environmental Sustainability in Healthcare', 'Impact of Environmental Sustainability in Healthcare in Patients', 'Challenges in Implementing Environmental Sustainability in Healthcare' and 'The Role of Healthcare Leadership in Improving Environmental Sustainability in Healthcare' (see Figure 1).

3.1 | Theme 1: Environmental sustainability practices in healthcare

Healthcare workers have a wide range of sustainability initiatives, collectively called sustainable practices. These endeavours reduce the ecological impact of healthcare activities while promoting adopting sustainable practices. Key steps towards sustainability for healthcare organizations include managing waste, using environmentally friendly materials, using environmental resources efficiently, assessing the health effects of environmental activities, conducting patient health education, advocating environmental health sustainability policy and encouraging patient participation.

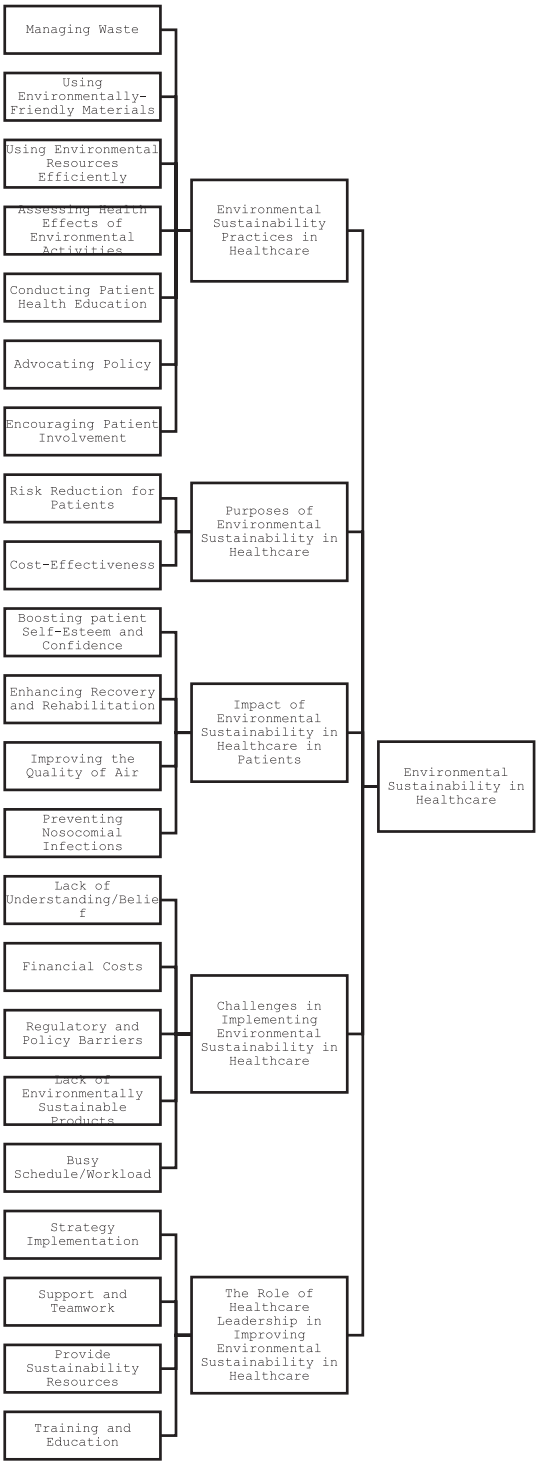

FIGURE 1 Themes and sub-themes that emerged from the thematic analysis.

3.1.1 | Managing waste

Healthcare facilities produce significant amounts of hazardous medical waste that require specialized management. Healthcare workers adopt waste management strategies to decrease environmental impact, occupational risks and resource wastage. Waste management practices are focused on segregation, recycling and suitable disposal, treatment and handling techniques.

> 'In the hospital, we do waste management, including processing and disposal of medical waste, using environmentally friendly materials, and a plan of action has been developed in case of spillage of chemicals and emergencies'.
>
> HW 21

3.1.2 | Using environmentally friendly materials

The medical institution purchases materials for its infrastructure, apparatus and equipment that are recyclable and sustainable to reduce its ecological impact. Using environmentally friendly materials can help prevent climate change, health issues and resource changes.

> We use environmentally friendly materials to minimize the negative impact of waste on the environment.
>
> HW 33

3.1.3 | Using environmental resources efficiently

Environmental resource efficiency is a method healthcare workers use to reduce energy consumption and conserve water. These approaches and strategies minimize greenhouse gas emissions and mitigate energy consumption.

> We strive to save energy, turn off the lights. Additionally, we optimize water consumption and turn off the water.
>
> HW 29

3.1.4 | Assessing health effects of environmental activities

Assessing health is a significant factor in determining the consequences of environmental activities. It is imperative to take this into account when evaluating health concerns. Health workers are responsible for determining and assessing potential public health hazards arising from poor environmental practices, which could be associated with issues in law, policy and human environmental practices.

> Health workers must assess patient health issues to determine the impact of environmental problems. Law and policy should be implemented accordingly to avoid abuse of the environment, which eventually affects a person's health.
>
> HW 11

3.1.5 | Conducting patient health education

Healthcare professionals are responsible for communicating to patients the ecological consequences of environmental activities such as smoking, which contribute to the volume of carbon dioxide released into the environment. Therefore, it is important to integrate environmentally conscious approaches into healthcare provision. Healthcare providers can assist patients in understanding the correlation between environmental factors and their well-being. Consequently, patients will have a more complete understanding of how to enhance their comfort levels during therapy.

> Health education should be provided to a patient on environmental sustainability to increase his awareness of the impact of his actions, such as smoking on the environment.
>
> HW 12

> I think I have the responsibility to educate the patient about environmental sustainability.
>
> HW 26

3.1.6 | Advocating policy

Advocating policies that consider environmental concerns and promote environmentally favourable policies on a global scale is one of the responsibilities of healthcare workers. This can be achieved by working with local, national and international industry experts. Cooperation with various stakeholders enhances the impact that change agents can have.

> Our role as a nurse is to advocate for sustainable practices with our patients, such as turning off the light when not in use. Also, to conserve water. Hospital policy on environmental sustainability is also instructed to patients, such as proper waste disposal.
>
> HW 35

> Environmental sustainability is a joint effort of leaders at the local, national and international levels.
>
> HW 5

3.1.7 | Encouraging patient involvement

Increasing patient awareness and participation in eco-friendly healthcare practices is a fundamental responsibility. Patients receiving medical treatment must minimize the environmental impact of the material used in their therapy. Patients can contribute to the sustainability of healthcare by modifying their behaviours and ensuring stricter participation in environmentally conscious practices.

> Patients in our hospital are informed about energy-saving measures such as turning off lights and electronics when leaving the room.
>
> HW 28

> We instruct our patients how to conserve water and properly dispose of medical supplies.
>
> HW 34

3.2 | Theme 2: Purpose of environmental sustainability in healthcare

Healthcare professionals' environmental sustainability practices are vital in promoting risk reduction for patients and supporting initiatives that promote sustainable funding. Healthcare professionals should actively advocate for and incorporate environmental sustainability into their routine work procedures to create clinical environments that benefit patients and healthcare workers.

3.2.1 | Risk reduction for patients

Sustainable healthcare practices can improve healthcare quality by guaranteeing a safe and healthy environment. Using natural lighting and adequate ventilation can contribute to creating healing settings for patients. Minimizing dangerous substances and toxic compounds can improve healthcare by avoiding patient contact. Health personnel mitigate the likelihood of adverse patient effects by overseeing environmental sanitation, waste disposal and infection prevention.

> Healthcare personnel, demonstrating active participation in environmental conservation, act as an example for patients, visitors, and society as a whole. Turning the light during the day helps to conserve energy. Opening the window helps the patient recover.
>
> HW 29

> Encouraging more environmentally responsible thinking and behavior among patients, visitors, and other staff is necessary for patient well-being. In addition, it brings economic benefits to the hospital, including reduced energy costs, reduced waste processing costs, and increased process efficiency.
>
> HW 30

3.2.2 | Cost-effectiveness

Adopting environmentally sustainable practices can optimize resource utilization, reduce operational costs and improve the delivery of healthcare services, enhancing efficacy and cost-effectiveness. Furthermore, sustainable healthcare strategies decrease expenses both directly and indirectly. Healthcare facilities can reduce energy use and minimize waste by adopting energy-efficient architectural designs, practices and technologies, leading to cost savings. Implementing sustainable waste management practices can reduce disposal expenses and improve sustainability.

> Healthcare personnel play a key role in ensuring compliance with procedures and cost-effectiveness of resources.
>
> HW 22

> Waste sorting, medical waste disposal, energy efficiency, water conservation, use of environmentally friendly materials, prevention of air pollution, training of personnel on environmental principles and methods that are cost-effective and minimize the negative impact on the environment.
>
> HW 24

3.3 | Theme 3: Impact of environmental sustainability in healthcare in patients

Eco-friendly techniques in the hospital can foster patient recovery. Hospitals reduce waste, use reusable medical equipment and implement a waste management plan to improve air quality, promoting positive health benefits and environmental sustainability. Hospitals also have environmentally friendly initiatives such as patient involvement, which can boost self-esteem and confidence in the patient and enhance recovery and rehabilitation.

3.3.1 | Boosting patient self-esteem and confidence

One role of health workers is to ensure that patients participate in sustainability initiatives, which gives patients a sense of empowerment and agency in their welfare. Active patient participation in promoting sustainability could determine the success of this endeavour.

> Participating in environmentally sustainable activities can improve patient self-esteem and confidence, especially if they feel that their participation makes a meaningful contribution to the sustainable environment.
>
> HW 32

3.3.2 | Enhancing patient recovery and rehabilitation

Improved sustainability of healthcare is recommended to optimize the recovery and rehabilitation process. This can improve medical services by providing treatment in a more hygienic and secure setting. Green buildings can create therapeutic patient environments by eliminating or decreasing sources of hazards. Minimizing

hazardous materials and toxic chemicals improves healthcare and protects patients.

> The health of patients is directly dependent on the state of the environment. Healthcare workers should prevent patients' exposure to hazardous chemicals and infections and improve the quality of air and water on hospital premises. Hospital environmental protection practices are important and necessary to ensure safe and quality patient care.
>
> HW 27

3.3.3 | Improving the quality of air

Gardening and ecological activities can improve patients' mental and physical health. Environmental sustainability, such as gardening, can soothe patients while also improving air quality. This practice is used in the medical hospital for aesthetic purposes, but it benefits the health of patients, staff and the environment. These practices in the hospital help provide air quality and environmentally sustainable practices.

> We have gardens for aesthetic purposes, but I think it is very important for cancer patients because it helps to provide good air quality.
>
> HW 31

3.3.4 | Preventing nosocomial infections

Health workers maintain workplace hygiene to reduce the spread of diseases linked to the healthcare industry, such as nosocomial infection.

> Compliance with the rules of hand hygiene. Use of personal protective equipment. Perform all types of cleaning. Prevention of nosocomial infections.
>
> HW 30

> Proper waste disposal prevents the growth of viruses and bacteria, and will provide good living conditions for patients and prevent the spread of disease.
>
> HW 28

3.4 | Theme 4: Challenges in implementing environmental sustainability in healthcare

Although environmental sustainability in healthcare is essential to reduce the ecological impact of the sector and improve public health, there are several obstacles to success. Implementing environmental sustainability in healthcare can require significant investments in state-of-the-art equipment and technology, jeopardizing the financial stability of healthcare providers. The lack of understanding, policy, regulation and procedures on environmental sustainability is an obstacle that could impede the establishment of sustainable healthcare. Certain healthcare personnel may be reluctant to accept change, while others can encounter legal barriers while trying to implement environmentally sustainable practices. Sustainable healthcare methods are valuable and worthwhile. Governments, healthcare providers and other stakeholders must engage in innovative interactions to promote sustainable healthcare practices.

3.4.1 | Lack of understanding/belief

Many hospital personnel and administrators may need a comprehensive understanding of the ecological consequences of their activities. This may be the result of misinformation or ignorance. Due to insufficient instruction and training, medical and healthcare professionals often lack interest and motivation to practice environmental sustainability. Additionally, resistance to change is prevalent within healthcare settings. While sustainable solutions have the potential to benefit the environment, their implementation may need to be improved by the existence of conventional practices and routines.

> Personnel's lack of understanding of the importance and benefits of environmentally sustainable practices may hinder their implementation.
>
> HW 30

> ... technical difficulties, lack of motivation, and interest in environmental practices.
>
> HW 26

> ...resistant to change is one of the challenges in the practice of environmental sustainability.
>
> HW 28

3.4.2 | Financial costs

Due to financial limitations, healthcare facilities, particularly public ones, may be unable to invest in environmentally sustainable practices, technologies and infrastructure. An inherent characteristic of this facility is its aversion to change and failure to adopt environmentally sustainable practices. The above phenomenon is often labelled institutional resistance.

> As workers, we can control and use our needs appropriately and wisely. However, integrating things that are truly useful to protect the environment requires

financial resources. There is a lack of budget for some institutions. Therefore, there is no implementation of environmental suitability practices.

HW 12

3.4.3 | Regulatory and policy barriers

The lack of laws and regulations to encourage or strengthen sustainable healthcare practices in certain circumstances constrains environmental sustainability practices. Environmentally conscious regulation and policy on intensive procedures, interventions, therapies and diagnostic procedures are unavailable.

> ... Of the general practices for protecting the environment, I am not familiar with any policy or hospital regulation on patient care and intervention related to environmental sustainability.. which affects our practices in our center... or maybe I am just unaware of them.
>
> HW 26

3.4.4 | Lack of environmentally sustainable products

The limited availability of environmentally sustainable products poses a challenge for healthcare facilities that seek to adopt green practices. Environmentally friendly medical equipment and supplies may be more expensive and challenging to acquire than conventional alternatives. The institution's mission and vision must be changed to achieve the healthcare industry's environmental sustainability objectives. To accomplish this, healthcare professionals, patients and administrators must adopt novel attitudes and conduct.

> Currently, we don't have sustainable products, and such products are available... It's so expensive that the center cannot afford to buy them. This issue is another concern in implementing environmental sustainability in health care.
>
> HW 27

3.4.5 | Busy schedule/workload

In the clinical area, healthcare workers are busy attending to the needs of the daily routine of patient care, anticipating medical procedures and treatment and the emergency conditions of patients who need immediate intervention. This situation and practice in the clinical area affect the delivery of environmental sustainability practices. Thus, achieving a harmonious equilibrium between performing environmentally sustainable practices and satisfying the patients' expectations is challenging.

> Our busy schedule, workload, and lack of wages affect our environmental sustainability practices.
>
> HW 30

3.5 | Theme 5: The role of healthcare leadership in improving environmental sustainability in healthcare

Healthcare professionals perceive that strong leadership and active participation are required for organizations to achieve long-term success and environmentally sustainable practices. The role of healthcare leaders in environmental sustainability is essential in formulating and implementing environmental strategies, including providing training, resources and support that promote environmental stewardship in the workplace.

3.5.1 | Strategy implementation

To ensure that the policy is implemented effectively, healthcare leaders should develop comprehensive action plans and sustainability strategies to incorporate sustainability into all aspects of healthcare practice. Implementing a strategic plan in the healthcare sector is needed to foster an innovative culture that promotes collaboration and communication between interdisciplinary teams and streamlines healthcare providers in institutions. Implementing sustainable practices strategies in the healthcare industry is crucial to ensuring patient care, improving health outcomes, reducing costs and increasing access to treatment.

> Leadership implements a strategy that includes specific goals and measures to reduce the negative environmental impact of hospital operations.
>
> HW 31

> ... the leader's role is to develop strategies to help in the joint efforts of healthcare providers in the practice of environmental sustainability.
>
> HW 32

3.5.2 | Support and teamwork

The participant mentioned that leadership support and teamwork are crucial to achieving environmental sustainability in healthcare. Healthcare leaders should promote teamwork among stakeholders, leading to collective influence in addressing environmental concerns and fostering a sustainable future. Healthcare leaders can achieve this by fostering collaboration, sharing expertise, combining resources, advocating for change, improving capabilities, providing support to each other and making a collective impact.

> We don't have a policy in place in our institution, but looking at it, the support of the administration is very important in the practice of environmental sustainability.
>
> HW 9

> The leader should communicate among himself, those of the South and North, to come up with a policy to use in the country. If we have an ecological policy, we could also impart it to our patients.
>
> HW 5

3.5.3 | Provide sustainability resources

Healthcare professionals mentioned that leaders are responsible for ensuring the availability of sustainable resources and following sustainable development principles. To maintain the hospital's environmental sustainability, it is essential to ensure resources, including increasing management abilities to promote sustainable development concepts. Financial, technical and human resources must be allocated methodically to meet sustainability obligations.

> In our workplace, we need to have a leader who is responsible for ensuring that resources are available. A leader who has a goal and ensures that there is a balance of available resources and a person who will implement environmentally sustainable practices. With these, there will be environmental sustainability.
>
> HW 7

> ..... Another role for healthcare leaders is to provide resources to ensure environmental sustainability practices.
>
> HW 19

3.5.4 | Training and education

Environmental sustainability in healthcare is a developing idea that has not yet been widely understood. The lack of knowledge and training on the benefits of environmentally sustainable healthcare practices and how to implement them can hinder the adoption of these initiatives. Thus, promoting the adoption of sustainable healthcare practices requires raising awareness of their value. Healthcare leaders should offer their personnel education through training and education programmes. Training and education initiatives can lead to behavioural change, promoting the adoption of sustainable healthcare practices.

> The administration's role in environmental sustainability is to conduct seminars, conferences, training, and infection control management to increase awareness of healthcare workers.
>
> HW 18

4 | DISCUSSION

The findings explored the perspectives of Kazakh healthcare professionals on environmental sustainability in healthcare. Five themes were identified and further elaborated:

First, healthcare workers noted several environmental sustainability practices in healthcare, such as waste management, the use of environmentally friendly materials, the efficient use of environmental resources, the evaluation of health effects of environmental activities, health education of patients, advocacy of policies and patient participation. This theme is worth considering, as these practices are important for adopting comprehensive environmental sustainability in healthcare institutions to mitigate their negative environmental impacts and improve overall healthcare outcomes (Mehra & Sharma, 2021). Specifically, one sub-theme, waste management, supports the idea of Lee and Lee (2022), who reported that proper waste disposal methods and recycling initiatives are necessary to minimize environmental pollution and promote sustainability within healthcare facilities. Likewise, another sub-theme, efficient use of environmental resources, is in congruence with a longitudinal study conducted in the United States, which stated that collective recognition of how environmental concerns and minimizing environmental impact influence the acceptance of environmentally friendly products (Qiao & Dowell, 2022). Optimizing resource usage, particularly water and energy, is essential to mitigate resource depletion and reduce carbon emissions (Prosen et al., 2023). Our qualitative findings based on the perceptions and experiences of Kazakh healthcare workers complemented and strengthened this quantitative evidence on the practices that healthcare institutions could implement to ensure environmental sustainability in healthcare.

Second, environmental sustainability in healthcare serves two primary purposes: reducing patient risk and cost. This finding explained that healthcare professionals recognize the critical role of environmental sustainability in minimizing health risks to patients by implementing risk mitigation practices (e.g., ensuring proper waste management and creating safer and healthier environments), supporting previous findings (Leal Filho et al., 2024; Tushar et al., 2023). Previous studies emphasize the importance of maintaining a safe healthcare environment in improving safe and quality patient care and recovery. The economic benefits of environmental sustainability were also emphasized by healthcare workers, supporting the idea that using sustainable environmental practices can optimize resource utilization and reduce potential costs in healthcare facilities, improving healthcare service delivery. This finding relates to the improvement in efficacy and cost-effectiveness where sustainable healthcare strategies can, directly and indirectly, reduce financial expenses. Singh et al. (2021) discovered that sustainable waste management practices ensure significant cost savings by lowering

disposal expenses. The finding was also in line with the study by Hannan et al. (2020), which explained that resource optimization, including water-energy conservation and efficient waste management practices, can significantly lower hospital bills and waste disposal expenses, facilitating substantial cost savings and financial efficiency in healthcare facilities over time. Therefore, the purpose of environmental sustainability in healthcare topics underscores the dual role of environmental sustainability practices in patient safety and economic efficiency within an improved healthcare setting.

Third, environmental sustainability significantly influences patients, including high self-esteem and confidence, improving recovery and rehabilitation, air quality and preventing nosocomial infections in healthcare settings. It was evident from the theme that sustainable healthcare practices contribute to a welcoming environment, positively influencing patients' psychological well-being and self-esteem while they are admitted to hospitals. This could be attributed to a supportive environment in patient care, which is important in achieving optimum well-being. For example, one study in Cyprus hospitals showed that an accommodating and welcoming hospital positively benefited patients' emotions and psychological health (Altinay et al., 2023). A scoping review in Romania revealed that primary care providers' awareness of available resources can create a warm, welcoming environment, leading to positive self-esteem and psychological well-being for patients and healthcare providers (Surugiu et al., 2023). Another study indicated that a warm and welcoming environment can prevent nosocomial infections by creating hygienic environments and minimizing the transmission of infectious agents to the host, shortening the duration of patient stay in the hospital (Gulumbe et al., 2022). This finding underscores the significant role of environmental sustainability in improving patient well-being and supporting better health outcomes.

Fourth, the current findings revealed that the challenges in implementing environmental sustainability in healthcare include lack of belief/understanding, financial costs, regulatory and policy barriers, lack of environmentally sustainable products and busy schedules or workloads. Healthcare professionals who experienced these issues and challenges could be demotivated to adopt sustainable practices. For example, financial costs are associated with implementing sustainability initiatives, such as infrastructure renovation or purchasing diagnostic equipment. Insufficient budget presents significant barriers to upgrading healthcare facilities, procuring sustainable materials and implementing environmentally sustainable practices (Oladejo et al., 2023). Financial constraints are also the main problems several healthcare facilities face, even in first-world countries (Cavicchi et al., 2022; Lee & Lee, 2022). Thus, cost-effective strategies to promote environmental sustainability in healthcare are recommended. Furthermore, high workloads and demands were frequently cited as one of the main challenges among healthcare professionals (Almazan et al., 2019), making it challenging to allocate time for sustainability initiatives. Other sub-themes identified were regulatory and policy barriers and the lack of supportive policies that can hinder the implementation of sustainable practice in a Kazakh healthcare setting. This result is in parallel with Aboueid et al. (2023) and Zurynski et al. (2023) who reported that a lack of supportive policies complicates efforts in sustainability integration into healthcare operations, leading to unsustainable practices. Thus, identifying critical factors that hinder the effectiveness of policies and initiatives from an organizational perspective is warranted, as they contribute not only to environmental conservation but also to reducing healthcare costs and promoting healthcare sustainability.

Finally, the findings emphasized the need for strong leadership, as it positively influences the implementation of environmental sustainability in healthcare. Healthcare leaders' effective implementation strategies should be clear and aligned with their organizational goals to ensure the appropriate allocation of financial resources and reduce costs. According to Tushar et al. (2023), strategic planning can guide an organization towards environmental sustainability. Specific sub-themes revealed that leaders who encourage and support teamwork create an environment that encourages communication and work engagement, supporting sustainability efforts. In a more organizational approach, when healthcare employees feel comfortable enough in work communication, it can lead to better problem-solving and creativity towards resource allocation (Aboueid et al., 2023). Additionally, it is important to recognize the training and education to raise awareness about environmental sustainability practice opportunities as stated on the sub-theme. Training and education are fundamental steps in improving the practice of environmental sustainability among healthcare professionals (Cruz, Felicilda-Reynaldo, et al., 2018). This result is further stressed by Pinzone et al. (2019), who explained that the effectiveness of training programmes in equipping healthcare staff is connected with the necessary knowledge and skills towards sustainability efforts as it increases understanding of environmental sustainability. Thus, leadership's dedication, support, teamwork, sustainability resources and training and education would drive towards better environmental sustainability outcomes.

Overall, the results of this study serve as a baseline knowledge about the current state of environmentally sustainable healthcare practices in Kazakhstan which can be beneficial in creating national policies and guidelines for implementing green practices and transforming climate-neutral hospitals and low-carbon-emission healthcare infrastructures. Furthermore, the leaders of various healthcare stakeholders in the country can use the findings of this study to develop their own policies and strategies to ensure an environmentally sustainable work environment. The study is a valuable contribution to the existing literature in general and specifically to the lack of healthcare environmental sustainability literature in Central Asia and other post-Soviet Union countries.

The recommendations for healthcare organizations and professionals are provided in Table 3. National and international support is required to realize these recommendations. For instance, the government of the country should create and enact policies (i.e., set standards for hospital waste management, energy use, procurement and use of sustainable healthcare products and integration of environmental sustainability topics in health sciences education) that support healthcare organizations in the country

to practice environmental sustainability. National governments can also motivate green practices in healthcare organizations by implementing financial incentives (i.e., tax breaks) and national recognition for healthcare organizations implementing effective environmental sustainability. Additionally, the government can assist by investing in innovating healthcare facilities in the country to support environmental sustainability practices (i.e., energy-efficient building, waste management and recycling facilities). The national government can allocate funds to support green initiatives, while international entities could help by providing grants and low-interest rate loans to support various efforts to transform the country's healthcare sector into a more sustainable system. International experts can also assist in educating healthcare workers about environmental sustainability and train local educators in innovative and evidence-based methods of teaching environmental sustainability in healthcare. Finally, collaborative research between researchers from Kazakhstan and international organizations and universities may help develop new technologies and practices for sustainable healthcare, advancing this area of research in the country.

4.1 | Limitations

We acknowledge some limitations of our study. First, although the number of participants for each FGD was adequate, most were nurses, making the other healthcare professionals (i.e., physical therapy and midwifery) underrepresented. Additionally, the FGD participants did not represent all healthcare team members, so the interpretation of the findings is limited to the perceptions of nurses, physicians, midwives and physical therapists. Second, there was a large difference in the number of men and women participants in the FGDs. During the recruitment, only three men agreed to participate in the FGDs. While there is a lower number of male (14.7%) healthcare professionals than females (85.3%) in the three hospitals, the proportion of men (8.3%) and women (91.7%) in the study does not reflect the real proportion of men and women healthcare workers. Thus, this limitation should be considered when interpreting the findings. Third, the data (in Kazakh and Russian) were translated into English before data analysis using a forward translation method only due to the challenges of conducting a backward translation into two languages. The loss of meaning in the translation could have happened. However, we implemented a quality measure to ensure an accurate translation by employing a trilingual person to check the accuracy of translations.

5 | CONCLUSION

This study explored healthcare professionals' perspectives in Kazakhstan on environmental sustainability in healthcare. The findings highlighted the perceptions and practices of healthcare professionals regarding environmental sustainability, the purposes of environmental sustainability in healthcare, the impacts on patients and the implementation challenges. The healthcare professionals identified their various sustainable healthcare practices that reduce the ecological impacts of healthcare activities. The study also discovered the roles of environmentally sustainable practices in healthcare in risk reduction and cost-effectiveness, as perceived by healthcare professionals. Moreover, healthcare professionals underscored how the perceived environmental sustainability impacts patient health care, such as improving patient self-esteem and confidence, recovery and rehabilitation and preventing healthcare-associated infections. The study underscored the critical role of strong and active leadership in ensuring the sustainable implementation of green policies in healthcare facilities and achieving successful results of environmentally conscious healthcare practices.

TABLE 3 Recommendations for healthcare organizations and professionals.

Recommendations based on the findings
1. Healthcare organizations should integrate environmental sustainability goals and practices in their organizational vision and mission, goals and strategies to ensure a widespread, intentional and sustainable implementation of environmental sustainability practices in healthcare.
2. Healthcare organization leaders should prioritize and value environmental conservation, promote and support teamwork and value lifelong learning to ensure the success of the implementation of environmentally conscious healthcare practices.
3. The healthcare organization should allocate resources for green efforts in its organization, which could include funds or resources to purchase environmentally sustainable products, redesign the physical environment of the hospital to be adaptive to environmentally sustainable practices and ensure adequate staffing based on international standards to prevent overloading and overworking of staff, giving them the opportunity and adequate time to consider integrating environmentally sustainable practices into their daily routine.
4. Healthcare organizations should provide opportunities for healthcare workers to expand their understanding of the environment and the issues surrounding it in the healthcare setting. These educational opportunities could be integrated with their professional advancement plan, which could focus on understanding the connection between the environment and health, the contribution of healthcare to environmental degradation, the potential contribution of healthcare to environmental conservation, the concept of environmental sustainability in healthcare, the different environmentally friendly healthcare practices and the personal and organizational challenges of implementing environmental sustainability practices in healthcare.
5. Healthcare professionals should develop a positive attitude towards the environment and environmentally conscious healthcare practices and actively participate in green initiatives implemented by the healthcare organization.
6. Healthcare professionals should be advocates for environmental conservation and green practices in healthcare. It is everyone's social responsibility to contribute to the preservation of our mother nature for the next generation.

AUTHOR CONTRIBUTIONS

Conception or design of the work: All authors. Acquisition of the data: MS, ZK, Alma S, ZD, Aizat S, JPC and EMB. Analysis and interpretation of the data: EMB, JPC, AG, JUA and PC. Drafting the work: All authors. Revising it critically for important intellectual content: All authors. Final approval of the version to be published: All authors. Agreement to be accountable for all aspects of the work: All authors.

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CONFLICT OF INTEREST STATEMENT

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