

Inequities in the Care and Outcomes of Indigenous People Living With Kidney Failure



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Kidney failure, defined as end-stage kidney disease requiring kidney replacement therapy, is a public health concern that disproportionately affects indigenous peoples around the world. Despite advancements in medical technologies and preventive public health interventions in kidney care, indigenous peoples continue to face significant barriers that limit their access to care. These barriers include limited availability of kidney care services in remote areas, cultural and language obstacles, systemic racism, low health literacy, geographic isolation, and mistrust in health care systems. Such challenges contribute to notable disparities in kidney disease outcomes and kidney replacement therapy access. Previous research in countries such as Canada, Australia, New Zealand, and the United States demonstrates a disproportionate burden of risk factors, chronic kidney disease, and the consequences of kidney failure and other complications among indigenous peoples. In this review, we explore the global landscape of kidney failure among indigenous populations, examining epidemiological data, barriers to care, and outcomes of kidney replacement therapy. The key objective is to provide a comprehensive overview of disparities in the burden of kidney failure and care inequities experienced by this high-risk population group. We propose culturally sensitive, community-driven solutions to mitigate various inequities. Addressing these issues requires acknowledging and overcoming the unique challenges faced by indigenous communities, including enhancing access to home dialysis and transplantation services and implementing culturally appropriate health care practices.

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Kidney failure is associated with adverse health consequences requiring expensive and technology-driven therapies such as dialysis and kidney transplantation (KT). It has been well established that Indigenous populations live with a disproportionately high burden of kidney failure and its related complications.¹ This marked increase in risk arises from a complex interplay of factors, including genetic, environmental, geographic, and socioeconomic variables, with significant diversity among tribes and cultures.² Despite advancements in medical technologies (therapeutics and medications) and proven public health interventions for prevention at the population level, indigenous communities continue to face significant inequities in access to and quality of care to manage CKD and thus prevent kidney failure. This is confounded by the limited availability of kidney care services in indigenous communities and other barriers relating to sociocultural issues, systemic racism, health literacy, geographic isolation, and mistrust in the health care system, complicating the kidney replacement therapy (KRT) provision landscape.³ These barriers result in significant disparities in the burden and outcomes across the spectrum of kidney disease and its complications.

To tackle these inequities, culturally sensitive, community-driven approaches and concerted efforts are essential to ensure equitable access to health care resources and services. This review examines these disparities in kidney care across indigenous populations around the world with a special focus on risk predisposition, epidemiology, and outcomes of kidney failure among indigenous populations, as well as challenges that limit access to KRT services and exacerbate inequities. The key objectives are to: (1) provide a brief synopsis on the landscape of kidney failure in Indigenous populations on a global scale; (2) outline barriers for access

to KRT across countries and how these vary across regions; and (3) discuss strategies to close identified care gaps and

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inequities and suggest potential solutions for an equitable and sustainable kidney care program for indigenous peoples around the world that respects their cultural values and perspectives.

RISK PREDISPOSITION TO KIDNEY FAILURE AMONG INDIGENOUS PEOPLES COMPARED TO THE GENERAL POPULATION

Indigenous peoples face a significantly higher risk of kidney failure compared to the general population for multiple reasons, including geographic, demographic, sociocultural, and clinical factors.⁴ Diabetic nephropathy and hypertension are the two most common causes of kidney failure among indigenous peoples,^{5–8} but there is also a higher incidence of nondiabetic kidney diseases such as glomerulonephritis, including IgA nephropathy and poststreptococcal glomerulonephritis.⁹ Genetic studies have identified significant associations between CKD and specific genomic variations in indigenous individuals. Healthy indigenous individuals may exhibit elevated levels of inflammatory markers, such as C-reactive protein, interleukin-6, and fibrinogen, which can be further exacerbated by CKD. Genomic variations affecting von Willebrand Factor function also plays a role, potentially influencing dialysis compatibility and contributing to complications.⁵

Health disparities among indigenous populations often begin antenatally and persist throughout life. About 14% of babies born to indigenous women are premature, and 12% have low birth-weight (<2.5 kg) as compared to 8.4% and 6.4%, respectively, in rest of the population.⁴ These outcomes may be partly driven by behavioral factors; for example, 44% of Australian indigenous mothers report that they smoke.^{10,11} Subsequent conditions, including type 2 diabetes, hypertension, obesity, and glomerulonephritis (particularly acute poststreptococcal glomerulonephritis), further increase the risk of kidney failure.^{5,12–14} These biological factors, combined with behavioral and environmental influences and disparities in health care access, contribute to worse outcomes for indigenous populations.

LANDSCAPE OF THE BURDEN AND OUTCOMES OF KIDNEY FAILURE AMONG INDIGENOUS POPULATIONS

According to the United Nations, over 476 million individuals from 90 countries around the world are indigenous, accounting for approximately 6.2% of the global population. Indigenous peoples are diverse, consisting

of more than 5000 distinct sociocultural groups worldwide.^{15,16} The prevalence and risks of kidney failure may differ for each group or region. As reported in national databases from high-income countries (Table 1), despite the higher burden (incidence and prevalence of kidney failure) of kidney failure in indigenous populations compared to the general population,^{17–19} the incidence rates of KT in indigenous populations are significantly lower. This disparity may be attributed to limited access to KT among indigenous communities. The literature is replete with information on the magnitude of the burden of disease and care disparities across various regions of the world.

In North America, it has been estimated that indigenous peoples comprise approximately 5% and 2% of the total populations in Canada and the United States, respectively.^{15,16} The prevalence of kidney failure among the indigenous population in Canada is twice that of the nonindigenous population, with a 77% increase in mortality risk

associated with kidney failure.^{20,21} For example, a retrospective study conducted in Saskatchewan found that the prevalence of kidney failure is much greater among indigenous individuals than among nonindigenous individuals.²² The study also noted that Indigenous individuals are often diagnosed late, not only presenting with advanced stages of CKD, but doing so at a relatively younger age.²³ In the United States, the incidence of kidney failure among Native Americans was found to be 2.3 times higher compared to the white population and twice as high compared to the Hispanic population, with this

CLINICAL SUMMARY

- Indigenous peoples experience a significantly higher burden of kidney failure compared to the general population. This disparity arises from a combination of biological, behavioral, and environmental factors and difficulties accessing appropriate care when needed.
- Access to sustainable kidney replacement therapy programs in indigenous communities is often limited by infrastructural availability (particularly in remote locations), difficulty hiring and retaining the requisite workforce (nephrologists, multidisciplinary care teams, etc.), and sociocultural barriers. Developing and implementing culturally sensitive and community-focused strategies can enhance access to kidney replacement therapy.
- Adapting health care practices to align with the cultural values and engaging with indigenous communities in decision-making can help mitigate some of the barriers that limit access to kidney care.

disparity worsening from 2018 to 2021.¹⁹

Indigenous peoples in Australia (Aboriginal and Torres Strait Islander peoples) constitute about 3.8% of the total Australian population and face a significantly higher burden of kidney failure compared to nonindigenous Australians, with prevalence of kidney disease approximately six-times higher than nonindigenous Australians.²⁴ Indigenous Australians often develop kidney failure at a younger age, particularly between the ages of 45 and 54.^{25,26} In New Zealand, the Māori, comprising about 15.6% of the population, also experience higher rates of kidney disease, with the most significant impact seen in those ages 65–74.^{26,27} In contrast to indigenous peoples in other nations who receive minimal governmental acknowledgment, the recognition of Māori cultural and political rights in New Zealand has had a beneficial impact on their health and social conditions.²⁸

Table 1. Burden of Kidney Failure Among Indigenous Peoples Compared to the General Populations of High-Income Countries (Comparative Risk Ratios)

	Australia ^{15,17} (2022)		Canada ^{16,18} (2011)		New Zealand ^{15,17} (2022)		United States ^{16,17,19} (2021)	
	General	Indigenous	General	Indigenous	General	Indigenous	General	Indigenous
Population (million people)	26.0	0.9	34.3	1.4	5.1	0.8	338.3	4.3
Prevalence of kidney failure (pmp)	1117	2978	1364	2671	1069	1407	2219	3346
Risk ratio		2.67		1.96		1.32		1.51
Incidence of kidney failure (pmp)	131	413	130	420	133	205	363	587
Risk ratio		3.15		3.23		1.54		1.62
Prevalence of dialysis (pmp)	597	2441	791	1950	617	1071	1600	2667
Risk ratio		4.09		2.46		1.74		1.67
Incidence of dialysis (pmp)	127	372	461	698	129	204	387	581
Risk ratio		3.24		1.51		1.58		1.50
Prevalence of kidney transplantation (pmp)	520	466	573	721	453	336	745	679
Risk ratio		0.90		1.26		0.74		0.91
Incidence of kidney transplantation (pmp)	4	1	N/A	N/A	4	1	12	6
Risk ratio		0.25		N/A		0.25		0.49

Abbreviation: pmp, per million population.

Risk ratio of events (indigenous: general population). Kidney failure is defined as chronic loss of kidney function requiring dialysis or transplantation. Incidence is defined as the number of new cases of such a condition occurring during such a year. Prevalence is defined as the total number of existing cases of such a condition occurring during such a year.

In Latin America, approximately 48 million people are members of indigenous communities, representing over 500 ethnicities. In countries such as Guatemala and Bolivia, indigenous populations comprise over 40% of their total populations and primarily reside in rural areas.²⁹ In Guatemala, the prevalence of kidney failure in rural Maya indigenous communities is reported to be lower than in the general population. Importantly, this does not necessarily reflect a lower incidence of kidney disease but rather health care accessibility challenges, which might result in underdiagnosis and underreporting.^{30,31} Over the past 2 decades, the prevalence of kidney failure in Latin America has increased substantially, from 119 per million population in 1991 to 660 per million population in 2010.³² This surge in the rate of kidney failure highlights the growing burden of kidney disease across the region, including among indigenous populations, who often face significant disparities in access to and quality of care.

DIALYSIS IN INDIGENOUS POPULATIONS: CARE AND OUTCOMES

Despite constituting a minority of the population, indigenous peoples often have a higher burden of kidney disease^{33,34} with a higher prevalence of hemodialysis but lower access to home dialysis therapies^{35–37} and KT.³⁸ For instance, First Nations people in Canada are 30% less likely to be treated with peritoneal dialysis (PD) than White Canadians³⁷ while Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry data show

that compared to indigenous women, both nonindigenous women and men are more likely to receive PD as their initial treatment (nonindigenous women: relative risk [RR] = 1.9, 95% confidence interval [CI]: 1.6–2.4; nonindigenous men: RR = 1.7, 95% CI: 1.4–2.2) and also more likely to commence initial treatment at home (nonindigenous women: RR = 2.1, 95% CI: 1.7–2.6; nonindigenous men: RR = 1.9, 95% CI: 1.6–2.5).³⁶

Several factors contribute to the variability in access to KRT among indigenous peoples, including geography (ie, living in remote or rural communities), poor health literacy, cultural factors, and historical factors such as racism and mistrust.^{2,39–42} Living in a remote location often leads to reduced access to primary and nephrology care, leading to late disease presentation and more unplanned dialysis starts, higher complication rates, and early mortality.⁴³ Geography also has an impact on outcomes such as mortality, which is higher among those living further from nephrologists (compared to those living within 50 km) according to a Canadian study of PD outcomes, suggesting a need to improve the quality of delivered care to remote dwelling indigenous peoples.⁴⁴ Age does not significantly modify these disparities, as both indigenous children¹⁰ and the elderly⁴⁵ have poorer outcomes and/or access to treatment than nonindigenous populations. For instance, indigenous children and young adults in Australia are more likely than other children and young adults to start KRT with hemodialysis (HD) (63.5% vs 47.5%; $P < 0.001$) and less likely to start KRT with PD (33.1% vs 35.7%; $P < 0.001$), receive

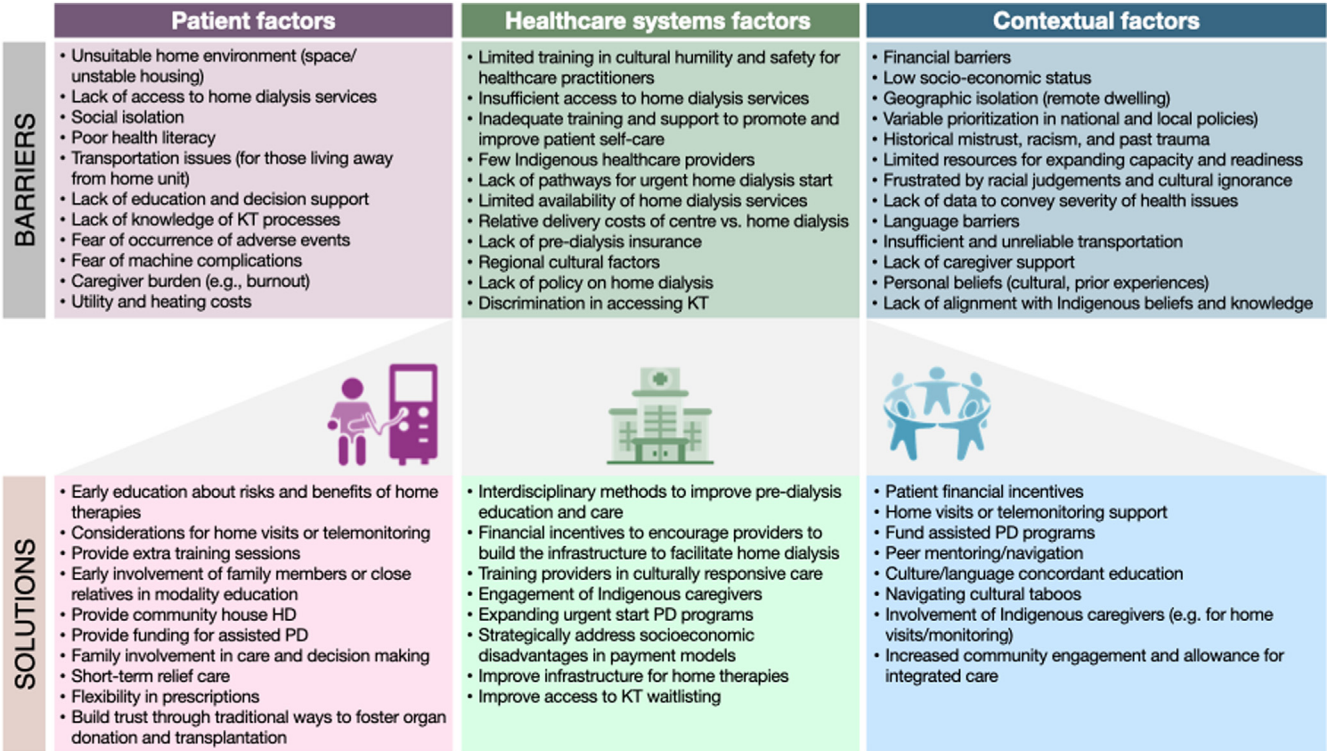


Figure 1. Barriers to KRT and strategies to enhance kidney care in indigenous populations. Abbreviation: KRT, kidney replacement therapy. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

KT (56.2% vs 89.3%; $P < 0.001$), receive pre-emptive KT (3.4% vs 16.8%; $P < 0.001$), and receive living donor transplants from relatives (10.7% vs 35.9%; $P < 0.001$).¹⁰ The consequences of reduced access to KRT, especially home therapies, mean they must travel farther for treatment²² or be indefinitely relocated to urban centers for treatment⁴³ thus separating them from ancestral homelands as well as family and community members, potentially resulting in adverse consequences related to grief, loss, and cultural isolation. Improving accessibility to and the cultural responsiveness of dialysis, especially home therapies, holds promise to improve outcomes in this population.⁴⁶

A number of studies have shown the quality of delivered KRT to be similar between indigenous and nonindigenous peoples. Chou and colleagues⁴⁷ reported similar quality of care between indigenous and nonindigenous Canadian patients receiving HD treatments. However, studies reporting outcomes of KRT treatment modalities often show discrepant or poorer outcomes for people of indigenous backgrounds.^{48,49} For instance, while a study from the United States reported a lower risk of death among indigenous patients (American Indians or Alaska Natives) compared to White patients receiving HD,⁴⁹ a Canadian study reported higher mortality ($P = 0.017$) among indigenous patients.⁵⁰ These discrepancies may reflect differences in national policies on timing of referral for KRT initiation, quality of delivered care, as well as treatment options available to patients at initiation of treatment. However, they also suggest the need to prioritize

prevention of kidney failure in this high-risk population group to help reduce disease burden and improve outcomes.

Indigenous patients receiving dialysis have also been shown to have a higher risk of all-cause hospitalization and infection-related hospitalization,⁵¹ as well as a higher risk of exit site infections and peritonitis,⁵² and to be impacted more by cultural isolation, alienation from family and friends, and loss of independence as a consequence of relocation to access treatment.⁵³ However, they are less likely to withdraw from dialysis compared to nonindigenous patients.⁵⁴ The experiences of indigenous patients treated with dialysis have been identified to revolve around the centrality of their family and culture, marginalization resulting from social inequities, vulnerability in accessing health care, and distress due to separation from their communities. Measures to improve dialysis outcomes in indigenous patients should focus on facilitating access to care and improving the cultural responsiveness of dialysis services.⁴⁶

Indigenous peoples often have challenges in accessing KRT, including in-center HD,⁵⁵ due in large part to remote dwelling and lower rates of KT.³⁸ Home dialysis, which has several advantages (eg, reliance on simpler techniques, feasibility of use in remote communities, and less need for trained staff),⁵⁶ could be an ideal modality for improving KRT delivery to indigenous populations with kidney failure. However, the global utilization of home dialysis (home HD and PD) is significantly constrained, with

only 11 countries (Australia, New Zealand, Hong Kong, Thailand, Sweden, Norway, Denmark, El Salvador, Canada, Mexico, and Colombia) reported to have more than 25% of treated patients receiving home-based therapies.⁵⁷ Barriers to home dialysis are often similar; a lack of dedicated and supported implementation policies (eg, PD first) is a common problem.^{57–59} However, indigenous peoples face barriers related to unique factors (Fig 1). Some patient-related barriers to utilization of home dialysis in indigenous populations such as residing in remote areas with a lack of access to home dialysis services, unsuitable home environments, fear of social isolation, poor health literacy, and an inability to pay for the costs of utilities and heating may be linked to such legacies.^{2,39–42,58,60} A study assessing barriers to PD utilization in Saskatchewan, Canada, revealed several reasons why patients do not pursue PD, including satisfaction with current in-center HD care (92%), proximity to HD units (61%), lack of understanding of the benefits/risks of PD (54%), fear of family burden (54%), unwillingness to conduct dialysis exchanges daily (51%), and unwillingness to learn a new technique (51%).⁶¹

Strategies to address these issues may include providing culturally appropriate education and awareness programs and implementing policy changes to enhance the use of home dialysis through coordination between elders of First Nations and provincial programs (eg, increasing funding for assisted PD or for community house HD programs).⁶¹ Community house HD, which is an important model of care, may help increase utilization and access to home dialysis services. In a New Zealand study of mostly Māori or Pacific Islanders that assessed the perspectives and experiences of patients choosing community house HD services, 4 themes were identified, including reducing the burden on family (eg, minimizing family exposure to dialysis and gaining a reprieve from home), offering flexibility and freedom, maintaining control of one's health, and building community support systems.⁶²

The health needs of indigenous patients are often complex and can be traced to the legacy of colonization.² To overcome this legacy, health care delivery to indigenous populations must meet standards of cultural safety, including the use of indigenous languages, laws, and protocols, and respect for indigenous self-determination, spirituality, and religion.^{2,63} Culturally safe processes should be leveraged to address other barriers including health care systems^{34,39,60,61,64} and contextual factors,^{2,39–42,58,60,65} such as low availability of indigenous health care workers, a lack of pathways for urgent home dialysis start, geographic isolation, and historical factors (eg, racism). Staffing dialysis units with indigenous health workers,⁴⁶ using telemedicine to reduce travel,² engaging in intensive listening and including indigenous peoples in home dialysis decision-making processes,⁶⁶ as well as improving patient financial incentives⁶⁷ could improve access to these therapies.

KIDNEY TRANSPLANTATION IN INDIGENOUS POPULATIONS: CARE AND OUTCOMES

Indigenous populations experience substantial challenges in accessing KT and achieving favorable outcomes.^{68–70}

Data from the Canadian Organ Replacement Register reveal that indigenous individuals aged 18–40 have a KT prevalence that is only half that of White individuals.⁷¹ Similarly, indigenous patients aged 51–60 are reported to be less likely to receive KT than their White counterparts.⁷² These disparities are especially pronounced among indigenous women and those waiting for living donor kidney transplants. Indigenous people face longer wait times, and this gap has worsened over time.^{38,71,73–75} Additionally, remote living conditions pose significant challenges in providing KT access to indigenous populations, further exacerbating these disparities.^{76,77} Data collected in high-income countries like Australia, Canada, New Zealand, and the United States show that indigenous patients consistently experience lower rates of KT and longer wait times compared to their white counterparts, despite variations in health care systems.⁷⁸

A systematic review of studies from Australia, Canada, the United States, and New Zealand demonstrated that indigenous peoples have notably poorer outcomes in terms of patient survival, graft survival, and delayed graft function compared to nonindigenous populations.⁷⁹ Indigenous KT recipients also experience higher rates of biopsy-confirmed acute rejection, particularly antibody-mediated rejection, which significantly contributes to graft failure.⁸⁰ The ANZDATA registry further shows that indigenous status is strongly associated with increased risks of graft loss, all-cause mortality, and deaths due to infections, with adjusted hazard ratios of 2.27, 2.36, and 3.01, respectively.⁸¹ Additionally, indigenous recipients face a higher incidence of infectious complications, such as urinary tract infections.^{82,83} The challenges associated with kidney graft rejection and the limited availability of specialized medical care in remote areas worsen post-transplant outcomes. Indigenous patients also experience higher hospital admission rates in the 2 years prior to transplantation, with early graft loss often linked to this factor.⁷⁸ Data from ANZDATA show that indigenous KT recipients have poorer 5-year graft and patient survival rates compared to nonindigenous recipients, with rural indigenous recipients having survival rates of 70% and 69%, respectively, compared to 91% and 92% for urban nonindigenous recipients.⁸⁴ While some retrospective studies suggest that short-term transplant outcomes do not significantly differ between indigenous and nonindigenous recipients within the first 5 years,^{83,85} Indigenous recipients are more likely to face adverse long-term outcomes, particularly at 10 years post-transplant.^{86,87} To improve kidney transplant outcomes, several key issues must be addressed. Indigenous children often experience longer cold ischemia times and higher immunologic risks, which negatively impact graft outcomes.^{10,79,87} Solutions might include enhancing access to transplant centers, optimizing transport logistics, and implementing better organ preservation techniques to reduce cold ischemia times. Additionally, improving communication and promoting live organ donations can help decrease HLA mismatches.⁸⁸ Medication nonadherence also significantly contributes to graft failure. Addressing this involves simplifying medication regimens, integrating clinical

Table 2. Kidney Replacement Therapy in Indigenous Populations: Challenges and Suggested Solutions

Study	Challenges	Suggested Solutions
El-Dassouki and colleagues ⁶⁸	• Poor knowledge about KT and kidney disease • Religion and spirituality • Social, cultural, and family considerations • Concerns related to systemic factors	• Enhancing the delivery of culturally appropriate education using indigenous ways of knowing • Understanding specific concerns and views regarding the acceptability of organ donation in the community • Understanding the historic, lived, and social/contextual roots of beliefs related to organ donation and health care in indigenous communities
Devitt and colleagues ²⁵	• Communication difficulties • Being uninformed about KT • Constrained family involvement in decision-making • Need to negotiate cultural and social sensitivities around KT	• Need to develop user-friendly, culturally informed, and region-specific patient education programs • Cultural considerations including (i) the integrity of the body, (ii) autonomy over one's body/actions, (iii) possible dangers associated with transgressing psychic boundaries, (iv) the ethics of directly requesting kin to consider donation, (v) perceived responsibilities of organ recipients for donor and family health, and (vi) potential obligations associated with organ donation. • Quality improvement cycles should underpin the development of national guidelines for patient education.
Cass and colleagues ⁹¹	• Geographical barriers • Cultural factors • Clinicians' attitudes toward patients regarding compliance and other realities • Organ allocation algorithms that impede access to deceased donor kidneys • Community attitudes regarding KT	• Remodeling health systems to ensure equity in the delivery of quality and effective KT services
Watters and colleagues ⁷⁷	• Communication barriers • Burden of travel and distance from treatment centers • Fear of negative outcomes • Limited understanding of illness and treatment options. • Social and cultural issues • System-level factors (eg, lack of continuity of care) • Adherence issues • KT-specific challenges (eg, lack of donor kidneys) • Poor motivation for KT	• Improved education and awareness programs • Social support services (eg, financial support) • Provision of both informational and emotional support from peer mentors with lived experience • Use of telehealth programs
Tait CL and colleagues ⁹⁹	• Issues with KT waitlists (eg, equity, utility, and racism) • Inadequate indigenous research on KT	• Using culturally safe methods for documenting and tracking indigenous identity • Development of training to address culturally specific needs • Provision of additional funding to support indigenous KT donors and recipients
Walker and colleagues ⁹⁰	• Lack of partners to support shared decision-making • Barriers to live kidney donation (eg, difficulty asking, impacts on donors) • Cultural considerations (eg, reconciling traditional values with need) • Experiencing lack of cultural competence in clinical care (eg, mistrust of clinicians and health system)	• Promotion of cultural safety • Incorporation of traditional values to promote KT and address inequities in access

(Continued)

Table 2. Kidney Replacement Therapy in Indigenous Populations: Challenges and Suggested Solutions (Continued)

Study	Challenges	Suggested Solutions
Keddis and colleagues ⁹²	• Poor communication/education about KT • Cultural beliefs regarding KT • Personal motivation and attitude toward KT • Financial burden of KT and post-transplant care • Attitudes about organ donation from living individuals	• Patient and family educational efforts to improve knowledge about organ donation from living individuals • Increasing the role of families in care and provision of support
Fahrenwald and colleagues ⁹³	• Knowledge gaps about KT • High prevalence of risk factors, hence shortage of donors • Traditional cultural beliefs (eg, entering the spirit world, donors' needs) • Trust in the health care system's competence (eg, with organ harvesting) • Outreach efforts to disseminate communication through local channels	• Need to address sociocultural factors that influence beliefs about organ and tissue donation
Jones and colleagues ⁹⁴	• Poor health literacy • Challenges asking anyone for a kidney, mainly due to concerns about donor health	• Providing recipients with support when approaching donors • Addressing cultural issues related to organ donation • Addressing issues with willingness and motivation to accept donation • Improving communication skills and health literacy • Providing psychosocial support
Harding and colleagues ⁹⁵	• Patient factors (eg, demographic, economic, cultural, and knowledge) • Provider factors (eg, miscommunication, staff availability, provider perceptions, and attitudes) • System factors (eg, geography, distance to care, and health care logistics)	• Need to implement a multipronged approach (eg, targeted and systemwide interventions, policy changes) at multiple levels of the health care system to reduce identified barriers
Jernigan and colleagues ⁹⁶	• Cultural beliefs • Conflicts with cultural and spiritual beliefs (eg, keeping the body intact for burial) • Mistrust of the local health care system	• Need to develop culturally relevant outreach materials • Targeted health messaging as strategy to reduce donor shortages
Anderson and colleagues ⁹⁷	• Physicians identifying indigenous patients as both noncompliant and high-risk KT candidates	• A transparent and fair system of patient selection should be a key objective of organ transplantation programs.

Abbreviation: KT, kidney transplantation.

pharmacists into patient care, and utilizing peer navigators. Exploring pharmacogenomics to tailor immunosuppression more effectively could also enhance graft outcomes.⁸⁹

Although indigenous people have a strong desire for KT, they experience several challenges in accessing optimal services, including a lack of partners to support shared decision-making, concerns about kidney donation from living individuals, cultural considerations, and a lack of cultural competence among health care workers who provide clinical care.⁹⁰ Several patient, health system, and contextual factors have been reported as barriers to equitable access to KT services in indigenous populations (Table 2).^{25,68,77,90,91,92–98} These can be summarized as challenges in effectively communicating how KT works,^{25,68,77,92,94,95} poor health literacy,^{68,77,92,94} conflicts with culture and spiritual beliefs,^{68,77,90,91,92,95} living in

remote or rural locations,^{91,95} the financial burden of KT,⁹² and personal factors, including poor motivation, mistrust of health systems, and adherence issues.^{68,95,96} Difficulty in explaining the processes associated with KT is a major barrier to access reported in several studies.^{25,68,77,92} This often arises from poor knowledge about KT and kidney disease among patients, which may be related to low literacy. In a qualitative interview study of Native Americans with kidney failure, participants reported that education about KT as a treatment option for kidney disease took place at the time of dialysis initiation or months to years later. Only one patient shared that their provider emphasized KT as a better treatment option than dialysis.⁹² In another study, patients were reported to experience multiple communication barriers that suggested an undermining of their engagement in treatment decision-making.²⁵ This suggests the need to

improve timely transplant education through simplified, user-friendly, culturally informed patient education programs and practices for Indigenous patients with CKD before dialysis requirements.

Indigenous peoples adhere strongly to unique cultural, spiritual, and belief systems, which can limit their ability to access biomedical care including KT.¹⁰⁰ For instance, it can be difficult to overcome cultural taboos about the process of organ procurement and transplantation (especially the use of kidneys from deceased donors) and a lack of approval from community elders.⁹² Fahrenwald and colleagues⁹³ identified traditional cultural beliefs such as entering the spirit world with an intact body as a barrier to donating organs for transplantation or accepting organs from deceased donors for transplantation. While it is important for programs that are targeted at increasing access to KT to respect traditional beliefs, they should present decisions about organ and tissue donation within the cultural context (eg, through storytelling by community members affected by kidney disease and by promoting family conversations about such issues).⁹³ Enabling support structures to facilitate approaching donors has also been suggested as a way to address specific cultural barriers.⁹⁴

Although some studies have not identified remote or rural dwelling as having a negative impact on access to KT,¹⁰¹ others have reported that it contributes to a lack of access to national transplant waiting lists. Samuel and colleagues¹⁰² reported that children living more than 150 km from a pediatric kidney care center are less likely than those living closer to receive KT regardless of donor type (living or deceased) at any time after the start of KRT. A multipronged approach implemented at multiple levels of the health care system is therefore necessary to address issues related to remoteness and access to KT among indigenous populations.⁹⁵ Other barriers and suggested solutions from various studies are summarized in Table 2.

STRATEGIES TO IMPROVE OUTCOMES OF INDIGENOUS PEOPLES LIVING WITH KIDNEY FAILURE

Disparities in and barriers to kidney care arise from a complex interplay of genetic, environmental, socioeconomic, and systemic factors, which result in higher rates of kidney disease and worse outcomes for indigenous patients (Table 2). Tackling these disparities necessitates a comprehensive approach. It is essential to develop and implement culturally tailored, community-focused strategies to improve predialysis education and care delivery and to help patients navigate the KRT process. This approach should involve enhancing health care infrastructure for home therapies, such as home HD and PD, especially in remote areas, as well as boosting health literacy and building trust between indigenous communities and health care providers.

Adopting culturally safe practices and policies, including the involvement of indigenous health care workers and the integration of traditional practices, can significantly improve patient outcomes.² Overcoming these challenges requires sustained efforts from policymakers, health care

providers, and community leaders. Quality improvement measures, such as incorporating regular patient feedback and redesigning health care systems, are crucial to ensuring that high-quality, effective, and equitable kidney care is accessible. These efforts should also inform the development of national guidelines for patient education, aiming to create a more inclusive and effective health care system for indigenous populations.

CONCLUSION

Kidney failure imposes a substantial burden on individuals, communities, and governments around the world. The costliest end-organ failure to treat, it is consuming substantial portions of national health care budgets and having significant social and economic impacts on individuals, families, and communities. These public health challenges are unfortunately more germane for indigenous populations around the world. Despite advancements in health technologies (diagnostics and therapeutics) and improved access to KRT technologies in general, indigenous people have continued to face significantly higher rates of kidney failure and barriers to care. Addressing these critical inequities in care via community-driven solutions is essential to eliminating these disparities and ensuring indigenous peoples receive the care they need at the right place and right time. This is paramount, particularly given the importance of reconciliation initiatives and processes in several countries and regions where indigenous peoples and governments are working together to help indigenous communities become stronger, healthier, and more sustainable. We can build on these strategic frameworks and initiatives to bridge the identified gaps in care, reduce the burden of kidney failure, and ensure these communities have access to care that is not only sustainable but of adequate quality, ultimately leading to better kidney health outcomes for all.

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