

Community co-design to target diabetes and metabolic syndrome in Australian Indigenous peoples



Diabetes mellitus is a chronic health condition in Australia¹, and disproportionately affects Australian Indigenous communities. Metabolic syndrome includes conditions such as hypertension, dyslipidemia, abdominal obesity and insulin resistance², and is responsible for earlier and more severe complications in individuals diagnosed with diabetes.

Diabetes mellitus contributes to 11% of all deaths in Australia, and costs the healthcare system (AUD)\$2.7 million annually¹. Australian Indigenous communities are disproportionately affected, with prevalence rates three times greater, hospitalization rates four times higher, and death due to complications five times more likely than in non-Indigenous Australians¹. Over the past four decades, strategies to address diabetes have accepted that it is an inevitably progressive condition, with treatment aiming to slow progression and prevent harmful complications³. Most initiatives to treat this disease in Australian Indigenous communities have focused on nutrition, education or health promotion programs. However, rates of diabetes in Australian Indigenous communities are rising, which suggests that current approaches for detection, care and management are failing^{1,4}. This leaves many Australian Indigenous communities feeling that a diagnosis of diabetes or metabolic syndrome is an unavoidable death sentence, creating a ripple effect beyond the individual, affecting the whole family and community. Ongoing loss of knowledge holders, such as Elders and senior leaders, generates innate cultural loss and disrupts the overall general health and wellbeing of the community, with knock-on effects that contribute to the persistent gap in health outcomes for Australian Indigenous communities.

In Australia, clinical guidelines for diabetes management recommend patient-centered approaches⁵. For Australian Indigenous patients, guidelines are focused on lifestyle modification, medication for glycaemic, lipid and blood-pressure control, and

community-based initiatives for healthy nutrition or physical activity⁵. Detection of diabetes in Australian Indigenous communities remains largely opportunistic through annual health checks⁵. Currently, Australia is not on track to meet its national Indigenous Health Check targets⁶. Australian Indigenous patients are too frequently labelled 'non-compliant' by clinicians and health professionals, owing to current models of care being based on Eurocentric biomedical knowledge systems. This can negatively impact an Australian Indigenous patient's journeys with diabetes and metabolic syndrome and can lead to negative health outcomes. These approaches and this deficit discourse are counterproductive to community-driven prevention responses, as recommended by national governing bodies (the National Aboriginal Community Controlled Health Organisation, the National Health and Medical Research Council and the Australian Institute of Aboriginal and Torres Strait Islander Studies), for community co-designed programs that address cultural determinants^{7,8}.

Diabetes Australia has recommended that strategies for diabetes remission be available to all Australians. This should include three evidence-based remission strategies: bariatric surgery, very low-calorie diets and ketogenic eating plans⁵. Bariatric surgery is not easily accessible and participant adherence to long-term low-calorie diets is poor, but recent evidence has shown that a ketogenic eating plan can put diabetes into remission without the need for glucose-lowering medication^{3,5}. Ketogenic eating works by restricting the intake of carbohydrates to a low enough level for the body to use fat as the principal energy source rather than carbohydrate³. A low-carbohydrate ketogenic eating plan appears similar to that of pre-colonization eating patterns for Australian Indigenous peoples. It can be hypothesized that Australian Indigenous peoples are advantaged in the uptake and maintenance of a ketogenic diet due to its alignment with Indigenous knowledges.

A critical aspect to targeting diabetes and metabolic syndrome remission within Australian Indigenous communities is through the centralization of Indigenous knowledges^{7,8}. These knowledges and methodologies have passed through generations and continue to evolve. Knowledge-interface methodology, an Indigenous research methodology, provides an excellent opportunity for knowledge-system integration. This allows Indigenous and Eurocentric knowledge systems, research methodologies, and methods to come together through mutual respect, shared benefits, human dignity and discovery for new knowledge formation^{9,10}. In this partnership, power differentials are redressed for Indigenous and dominant Eurocentric knowledge systems, ensuring that Indigenous knowledges are central to research questions, conceptualization, co-design, data collection, analyses and translation of outcomes. This approach provides authentic understandings for Australian Indigenous communities, focused on the cultural determinants of health. It also ensures multiple approaches for investigating research questions, such as strength-based approaches and community autonomy through ownership and control.

Strength-based approaches are implemented through valuing and centering Australian Indigenous knowledges and understandings of nutrition and health into research, along with recognizing and actively addressing impacts from ongoing colonization^{9,10}. These approaches occur through Australian Indigenous leadership across research teams, governance and community partnerships, as well as investment, which creates community autonomy and ownership. These approaches shift deficit discourses and avoid perpetuating colonization and white possessive logic^{9,10}. They also align with key recommendations for Aboriginal and Torres Strait Islander research by the National Health and Medical Research Council⁸ and the Australian Institute of Aboriginal and Torres Strait Islander Studies⁷.

The Coorong Diabetes Collaborative project came directly from this reciprocally respectful approach. During periods of intensive engagement during COVID-19 outbreaks, it was apparent to clinicians trained in Eurocentric-based medicine, and to the Ngarrindjeri community, that diabetes and metabolic syndrome levels in the community were a critical, ongoing vulnerability. Ngarrindjeri leaders expressed enthusiasm for an opportunity for their people to be able to benefit from new approaches for diabetes remission. Their wish was a community-designed program centering on cultural determinants of health (ownership, control and reciprocity) to produce longevity for their people. The Coorong Diabetes Collaborative project has been designed to draw on strong Australian Indigenous leadership, connecting Ngarrindjeri knowledge holders, Australian Indigenous researchers, clinicians and health professionals with Eurocentric knowledges and research methods from experienced clinicians, nanoengineers, dietitians, public health researchers and point-of-care testing. Through mutual respect, shared benefit, human dignity and discovery, this union will co-design the first targeted and scalable diabetes remission program for Indigenous peoples on Ngarrindjeri country^{9,10}.

The project aims to explore how Australian Indigenous peoples are advantaged by adopting a ketogenic diet. The project will co-develop an eating program that includes important cultural and contextual factors, as identified by the community, along with educational and motivational strategies for a ketogenic eating program, and monitor physiological, social and economic outcomes. This

may require safely deprescribing for people who use glucose-lowering medication, which will be monitored by point-of-care testing. Prospective candidates will be identified via community screening, in partnership with Indigenous peoples living on Ngarrindjeri country. Capacity building of local Indigenous peoples on Ngarrindjeri country will be a focus of the program, including the use of technology and implementing the identification, education and monitoring approaches through upskilling and training, to maintain community ownership and control. The intended outcome of the Coorong Diabetes Collaborative is to reduce disease burden in Australian Indigenous communities caused by diabetes and metabolic syndrome, by helping to co-design a program founded on Indigenous knowledges that focuses on remission for now and in the future. The project is being supported by funding from the Australian government's Medical Research Future Fund's (MRFF) Indigenous Health Research Fund (IHRF) and is being run entirely on Ngarrindjeri country.

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Competing interests

The authors declare no competing interests.