



Research Article

A Comparison in Diabetes Management between Rural and Urban Patients

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Abstract

Introduction: Diabetes mellitus, a chronic non-communicable disease, is on the rise globally. This phenomenon is well recognised as a concern within the New Zealand health system. There are growing inequalities in health between non-Maori and Maori and other social groups. Are those that live in close proximity to a health care centre, better off than those that live further away? This research will help better understand the relationship between patient's geographical situation and their health care centre location.

Aim: The aim of this research is to explore whether there is equity in diabetes with relation to the proximity to a primary health care provider. Specific bio markers will be compared to patients living within 4.9 kilometres and those living greater than 5 kilometres from their health care provider.

Methodology: A quantitative audit was undertaken with patients within an urban health care centre with a population identified as 91% high needs. The data was then segregated into urban and rural areas. A comparison of clinical data between the two cohorts was analysed for differences in diabetes health management.

Results: The findings showed marginal difference between rural and urban patients in managing their diabetes. The HbA1c measures are similar between both cohorts. However twice as many patients are diagnosed with depression rurally than urban patients.

Discussion: The resources in managing and treating diabetes to the health system, is substantial. In addition, educating patients in high deprivation areas on diabetes management within the restraints of primary care, can be challenging. Therefore, it is important we assess how effective our efforts are while looking at what are the areas working well and what areas need improving. Better understanding leads to better interventions.

Keywords: Diabetes; Health Care Centre; Rural; Māori; Urban

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What the Gap Fills

What we already know: The prevalence of diabetes in New Zealand is projected to increase by 30% over a decade and will affect greatly those from deprived areas [1,2]. This will present a challenge in resources and cost for the primary health care sector. What this study adds: Is the location of the health care provider a contributing factor for patients managing their diabetes. This research demonstrates that in relation to the proximity of their health care can, does not necessary determine their diabetes management.

Introduction

The prevalence of diabetes is both rising in New Zealand and worldwide [3]. Primary care has a very important role in diabetes management and utilization is strongly linked to reduced hospital admissions [4]. This paper will assess the equity with those patients that have a diagnosis of type 1 or 2 diabetes mellitus in relation to rural and urban patients. As a Long Term Conditions nurse my colleague and I began to question if those patients with diabetes that live rurally are worse off than those patients that live in urban areas. A barrier to diabetes management has a detrimental effect on a patients and their families well-being [5,6]. The locational proximity or travel time is a determinate of health service accessibility [4]. In their study [7] showed the main source of diabetes education patients received, is from general practice. It was hypothesised if proximity to their primary health care centre was detrimental to adequately managing their diabetes. There is no internationally recognised definition of a 'rural' area but has traditionally been residual areas not included in the urban definition (Stats NZ, 2019). For the purpose of this study the definition of rural are those patients outside a 5kilometer radius from their health care provider.

According to the Ministry of Health data 2011, diabetes mellitus in New Zealand had 11,000 new diagnoses, 180,000 prevalent diagnoses and 1900 deaths attributable to diagnosed disease and is forecast to get worse [4]. The prevalence of diabetes among Māori is twice that of non-Māori [8]. Māori are often associated with co-morbidities and long-term conditions, with a high-risk of developing cardiovascular disease and cancer [9]. Renal failure is one of the complications of diabetes. Rates of renal failure with concurrent diabetes for Māori aged 15 and over were more than 5 times that of non-Māori at the same age group [8]. Therefore, it is important that patients practice good diabetes management to slow down disease progression with the help of their health care provider. Health literacy is a key determinant for enabling the empowerment of the patient and is recognized as a barrier particularly with Maori [9]. The patient's understanding of medical terminology is influenced greatly by their level of health literacy. When caring for people with diabetes amongst indigenous communities, for every dollar invested in primary care can have a saving of four health dollars [10].

In general discussion with the diabetes team, it was suggested that perhaps distance from the health centre, may have influence their diabetes management. The aim of this paper is to identify comparisons

between diabetes patient’s bio markers, in relation to the distance they live from their health care centre. The Health Centre used in this study has 91% identified as high needs. High needs defined as Māori, Pacific and or Quintile 5. Of the enrolled population 78% are Māori, 5% Pacific Island and 17% are other ethnicities [11]. The communities and environmental influences that affect health and wellbeing are for some peoples beyond their control [12]. These circumstances contribute to poor health and inequalities, resulting in burgeoning chronic disease and poor health literacy [13]. A common denominator of successful long-term models of support is indigenous support from the community. For this study, “high-risk” patients are defined as those with or at risk of long-term conditions, such as diabetes or heart disease [14]. Those deemed high-risk are expected to place further pressure on health resources with each long-term condition estimated to cost \$100 million annually [15]. Improving access to primary care for patients to manage their diabetes, is both a benefit to the health of patients and in cost savings for the government.

Background

Primary health care undertakes a variety of interventions in health prevention and health education while supporting healthy lifestyles. Area deprivation is strongly associated with poorer health and increased racial discrimination [16]. Such cohorts’ in health and economic status often go on to deteriorate, unless the right interventions are delivered (Buck & Frosini, 2012). Diabetes affects Māori proportionally higher compared to non-Māori in New Zealand. The New Zealand Health Strategy aims to address issues of equity in health for all the population. Within New Zealand some gains have been made towards health equity over the last 20 years, such as improved immunisation rates for Māori. However, more work needs to be done to achieve health equity for Māori [17]. It is shown that whilst Māori keep their appointments with their general practitioner at the same rate as non-Māori [18], Māori have fewer diagnostic tests, less effective treatment plans and are referred for secondary or tertiary procedures at significantly lower rates than non-Māori [19,20].

It is important that our practice as primary health professionals reflects the changing social determinates of health, particularly for high needs populations. My experience as a Long-Term Conditions nurse with a focus on diabetes and cardiovascular disease while working with high needs patients, is always about providing worthwhile and effective engagement. My role in the community team, allows for flexibility in resources. The team use a Kaupapa Maori framework with access to other Maori centred support agencies. Despite these resources we don’t always have the opportunity to make comparisons with the cohort which we work with.

Methods

Korowai Aroha Health Centre is a Māori health provider with an enrolled population of 5117 patients. The health centre has a staff of general practitioners registered nurses, community workers and support staff while managing several community health contracts. An audit of 372 patients with diabetes was undertaken using the patient diabetes data base from within the health centre. This consisted of those patients diagnosed with Type 1 and Type 2 diabetes mellitus, with the diagnosis defined in accordance with the New Zealand Group Guidelines (Ministry of Health, 2012). Those patients that are symptomatic with an HbA1c \geq 50 mmol/mol or asymptomatic with an HbA1c

HbA1c \geq 50 mmol/mol, with 2 results above diagnostic cut-offs on separate occasions. These patients were then grouped into the following categories; type, year of diagnosis, age, visits to their primary health provider including hospital visits, gender, diagnosis of depression, gout, respiratory condition, Chronic Obstructive Pulmonary Disease (COPD), cardiovascular risk assessment, medication prescribed, blood pressure, medication, quintile, referral to other primary services, community service card user and proximity to the health centre. The clinical data was retrospectively collected within a 12 month period. The proximity to the health care provider was in 2 categories 0 to 4.9 kilometres and greater than 5 kilometres. The data was then analysed for a difference in diabetes management using the above bio markers and clinical interventions and social deprivation. Ethics approval was not required as this was an auditing method of data collection.

Results

The results show a quarter of the registered population live rurally. Greater numbers of males with diabetes, live in the urban areas than rurally (Table 1).

Proximity to Health Centre:	Live less than 5ks	Live less than 5ks	Live greater than 5ks	Live greater than 5ks
Gender percentage:	Female 39.6%	Male 60.4%	Female 48.3%	Male 51.7%

Table 1: Proximity to Health Centre.

The difference between the two cohorts showed marginal difference in HbA1c, with overall high cardiovascular risk assessments in both cohorts. There were no statistically significant differences in both cohorts. However there was some evidence to show depression more in rural patients than urban. The table below shows the comparative data from those less than 5kms to the health centre to those living greater than 5ks (Table 2).

There is no statistical difference between cohorts for those prescribed medication; insulin, statins and Angiotensin-converting-enzyme inhibitors, which would indicate prescribed medications are used equally between the cohorts.

Visits to allied health professionals showed a 1% difference between the cohorts with retinal screening with more patients from the rural cohort visiting the podiatrist. This could be argued that those living rurally are not disadvantaged any less than the urban population. Interestingly, twice as many patients are diagnosed with depression in the rural sector (Table 3).

The table below shows deprivation and community services card use.

The greater population that live both less than and greater than 5ks from the health care provider, are in lower social deprivation areas.

Those with the greatest deprivation live greater than 5 Kilometres away from the Health centre.

On average 59% in both cohorts have a community services card. This is comparable with the high quintile population. The key findings showed little difference in patient’s management of their diabetes between urban and rural areas. The data demonstrates this cohort is achieving equity within this Māori population.

Comparison of medical markers:				
Category with Percentage values:	Less than 5ks	Less than 5ks	Greater than 5 ks	Greater than 5 ks
Type 2	2.0% of total pop	98.0% of total pop	2.2% of total pop	97.4% of total pop
Gout Diagnosis	With-out 84.2%	With 15.8%	With-out 81.9%	With 18.1%
Depression Diagnosis	With-out 97.0%	With 3.0%	With-out 93.0%	With 6.6%
Visits to Primary Health Care Centre in last 12 months	Not visits 25.7%	Visits to 74.3%	No visits 24.4%	Visits to 75.6%
Visits to Hospital in last 12 months	No visits 57.4%	Visits 42.6%	No visits 55.7%	Visits 44.3%
Insulin (currently on insulin, or initiated within 6 months)	No insulin 66.3%	Insulin 33.7%	No insulin 66.1%	Insulin 33.6%
Prescribed ACE	Not taking 46.5%	Taking 53.5%	Not taking 46.5%	Taking 53.5%
Prescribed Aspirin	Not taking 71.3%	Taking 28.7%	Not taking 67.5%	Taking 32.5%
Prescribed Statin	Not taking 40.6%	Taking 59.4%	Not taking 42.4%	Taking 57.6%
Retinal Screen in last 2 years	Not screened 23.8%	Screened 76.2%	Not screened 22.9%	Screened 77.1%
Podiatrist	Not seen 99.0%	Seen 1.0%	Not seen 92.6%	Seen 7.4%

Table 2: Comparison markers.

Deprivation					
Quintile	Q1	Q2	Q3	Q4	Q5
Live less than 5ks	6.9%	3.0%	10.9%	20.8%	58.4%
Live greater than 5ks	0.7%	4.1%	3.7%	15.1%	76.4%

Table 3: Comparison markers.

Community Services Card	Live less than 5ks	Live greater than 5ks
CSC holders Yes	60.4%	57.2%
CSC holders No	39.6%	42.8%

Discussion

Research shows diabetes is one of the majority contributors to mortality for both Māori and non-Māori. As primary health care professionals it is always important to know if we are making a difference and if we have room for improvement or even to understand better those interventions that show improvement. Travel times from patient's health care provider have been linked with poor health outcomes [4]. Whilst this study has highlighted areas for improvement, there are areas that appear to be working well. This may be contributed by the model of care this health centre is using for their diabetes patients. This could have implications for improving the modal of Long Term Conditions. This study shows some positive outcomes in biomarkers between both cohorts. Thus, suggesting distance from patient to health care provider may not be a disadvantage. Further research into analysing how the support these patients could add value for primary health professionals.

Recommendations

Whilst it is theorised that patients living in a rural location have poorer outcomes than those living in an urban environment. In this study, the results showed minimal difference in outcomes for this health centre.

- A follow up study on those patients to explore why there is little difference between the cohorts in managing their diabetes

- From a quality improvement perspective, it would be important to explore what interventions are used and how the service is influencing these patient's diabetes management
- Investigate why there is a greater number of rural patients with depression compared to urban patients with depression
- This could be a potential learning opportunity for health professionals working in primary health care
- This study would be interesting to compare if repeated in a similar health centre

Limitations

It is acknowledged the limitations in this study are the size of the data base. The data could have included the rationale for visiting health professionals. This could determine if the visit was either related to their diabetes or completely an unrelated medical matter.

Conclusion

Primary health care services have an obligation to work with patients in an environment in which they feel supported in. Whilst sometimes this can present as a challenge for primary care professionals, supporting patients inside or outside the health centre is always worth investigating. Learning more about how we support a positive change in their environment can be a driver into improving our services.

Conflicts of Interest

The author declares no conflict of interest in this research.

References

1. Joshy G, Porter T, Le Lievre C, Lane J, Williams M, et al. (2009) Prevalence of diabetes in New Zealand general practice: the influence of ethnicity and social deprivation. *J Epidemiol Community Health* 63: 386-390.
2. Tobias M, Yeh L, Wright C (2007) Diabetes surveillance population-based estimates and projections for New Zealand, 2001-2011. *Public Health Intelligence Occasional Bulletin*. Ministry of Health, Wellington, New Zealand.
3. Jannoo Z, Mamode KN (2019) Medication Adherence and Diabetes Self-Care Activities among Patients with Type 2 Diabetes Mellitus. *Value in Health Regional Issue* 18: 30-35.

4. Hiscock R, Pearce J, Blackely T, Witten K (2008) Is neighbourhood access to health care provision associated with individual-level utilization and satisfaction? *Health Services Research* 43: 2183-2200.
5. David S, Lillis S, Swan J, Haar J (2007) Discordance in perceptions of barriers to diabetes care between patients and primary care and secondary care. *Diabetes Care* 30: 490.
6. Tesa P, Le Lièvre C, Lawrenson, R (2009) Why don't patients with diagnosed diabetes attend a free 'Get Checked' annual review? *J Prim Health Care* 1: 222.
7. Lawrenson R, Joshy G, Eerens Y, Johnstone W (2010) How do newly diagnosed patients with type 2 diabetes in the Waikato get their diabetes education? *J Prim Health Care* 2: 303-310.
8. Ministry of Health (2018) Diabetes. Ministry of Health, Wellington, New Zealand.
9. Ministry of Health (2015) Health Literacy Review: A guide. Ministry of Health, Wellington, New Zealand.
10. Thomas SL, Zhao Y, Guthridge SL, Wakerman J (2014) The cost-effectiveness of primary care for Indigenous Australians with diabetes living in remote Northern Territory communities. *Med J Aust* 200: 658-662.
11. Lane J (2016) Korowai Aroha Health Clinic Practice Profile - GP Clinic. Korowai Aroha Health Centre, Rotorua, New Zealand.
12. Berwick DM (2009) What 'patient centred' should mean: Confessions of an extremist. *Health Affairs* 4: 555-556.
13. Marmot M (2005) Social determinants of health inequalities. *Lancet* 365:1099-10104.
14. National Health Committee (2006) Meeting the needs of the people with chronic conditions. National Health Committee, Wellington, New Zealand.
15. Ministry of Health (2009) Report on New Zealand Cost-of-Illness Studies on Long-Term Conditions. Ministry of Health, Wellington, New Zealand.
16. Bécaries L, Cormack D, Harris R (2013) Ethnic density and area deprivation: Neighbourhood effects on Māori health and racial discrimination in Aotearoa/New Zealand. *Soc Sci Med* 88: 76-82.
17. He Korowai Oranga, Ministry of Health (2014) He Korowai Oranga Maori Health Strategy. Ministry of Health, Wellington, New Zealand.
18. Bacal K, Jansen P (2008) Best health outcomes for Maori: Practice implications. In: Māuri Ora Associates, Medical Council of New Zealand, Wellington, New Zealand.
19. Ajwani S, Blakely T, Robson B, Tobias M, Bonne M (2003) Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999. Ministry of Health, Wellington, New Zealand.
20. Tukuitonga CF, Bindman AB (2002) Ethnic and gender differences in the use of coronary artery revascularisation procedures in New Zealand. *New Zealand Medical J* 115: 179-182.



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